



**US Army Corps
of Engineers®**

Joe Pool Lake 2019 Master Plan

Trinity River Basin
Mountain Creek, Texas
Dallas, Ellis, and Tarrant Counties

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DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, FORT WORTH DISTRICT
P.O. BOX 17300
FORT WORTH, TX 76102-0300

CESWF-PEC

21 March 2019

MEMORANDUM FOR Commander, U.S. Army Corps of Engineers (USACE),
Fort Worth District (SWF)

SUBJECT: Joe Pool Lake Master Plan Revision (February 2019)

1. **PURPOSE:** Enclosed subject Master Plan is submitted for review and approval in accordance with Engineering Regulations (ER) 1130-2-550, Change 7 and Engineering Pamphlet (EP) 1130-2-550, Change 5.
2. **BACKGROUND/DISCUSSION:** In accordance with ER *1130-2-550 Change 07, dated 30 January 2013* and EP *1130-2-550 Change 05, dated 30 January 2013*, Lake Project master plans are required for most USACE water resources development projects having a federally-owned land base. This revision of the Joe Pool Lake Master Plan is intended to bring the Master Plan up to date to reflect ecological, socio-demographic, and outdoor recreation trends that are currently affecting the lake, as well as those anticipated to occur within the planning period of 2019 to 2044, a 25-year period. Joe Pool Lake is unique among Fort Worth District lakes in that all designated park areas are operated by non-Federal entities including Texas Parks & Wildlife Department and the City of Grand Prairie. Extensive coordination was conducted with these two critically important stakeholders.
3. **SUMMARY OF CHANGES:** The revision resulted in the preparation of new resource management objectives and the following changes to land use classifications:

Prior Land Classifications (1981)	Acres		New Land Classifications	Acres
Project Operations	309		Project Operations	308
Recreation – High Use	3,236		High Density Recreation	4,043
Recreation – High Use/Interim Wildlife ²	1,756			
			Environmentally Sensitive Areas	1,507
Recreation/Wildlife Management – Low Use	3,360		Multiple Resource Management - Low Density Recreation	578
			Multiple Resource Management – Vegetative Management	157
			Multiple Resource Management – Wildlife Management	2,070
Permanent pool	7,470 ³		Permanent pool	6,707 ³
Total	16,131¹		Total	15,370¹
Flowage Easement	1,904		Flowage Easement	1,904

¹The new land classification acreage figures were measured using GIS technology and may vary slightly from prior classifications, and from official land acquisition records.

²Included within the acreages of Recreation High Use and Recreation High Use/Interim Wildlife is 1,475 acres of Separable Recreation Lands that were acquired for the sole purpose of Recreation.

³The 7,470 acre figure has been used as the conservation pool acreage for many years, but more refined measurements performed as part of the revision of the 1981 Master Plan indicates the conservation pool is 6,707 acres.

a. The above changes were the result of public and stakeholder review and comment, review of regional trends in outdoor recreation and resource protection, and compliance with Federal policies and mandates governing Federal land use. Environmentally Sensitive Areas were identified for the protection of important biological communities, as well as culturally significant sites and unique views and landscapes.

b. In accordance with the National Environmental Policy Act of 1969, including guidelines in 33 Code of Federal Regulations Part 230, an Environmental Assessment (EA) was prepared to assess the potential impacts that the alternative management scenarios set forth in the 2019 Joe Pool Lake Master Plan (2019 Master Plan) would have on the natural, cultural, and human environments. The EA evaluated and analyzed

two alternatives: a No Action Alternative (continued use of the 1981 Master Plan) and the implementation of the 2019 Master Plan. Based on the findings of the EA, the implementation of the 2019 Master Plan would not result in significant adverse impacts on the environment or constitute a major Federal action significantly affecting the quality of the human environment.

c. The Master Plan and EA have been reviewed by the Regional Planning and Environmental Center, SWF Operations, SWF Real Estate and SWF Office of Counsel. The final version of the documents went through a 30-day public and agency review. All comments from the reviews have been addressed.

4. RECOMMENDATION: The Project Delivery Team members have reviewed and approved the Master Plan revision. The team recommends approval by each signatory, as well as approval and signature of the Finding of No Significant Impact by the Commander.

Approve ✓
Disapprove _____
Date 3/27/19


ARNOLD R. NEWMAN
Director, Regional Planning &
Environmental Center

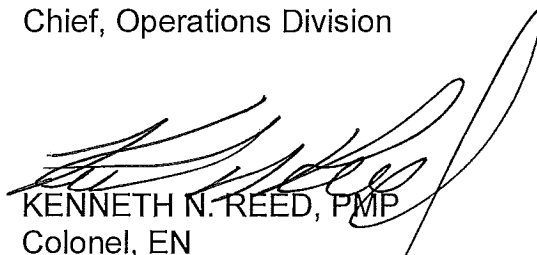
Approve ✓
Disapprove _____
Date 3/27/19


ROCKY D. LEE
Chief, Real Estate Division

Approve ✓
Disapprove _____
Date 25 Mar 19


TIMOTHY L. MACALLISTER
Chief, Operations Division

Approve ✓
Disapprove _____
Date 29 Mar 2019


KENNETH N. REED, PMP
Colonel, EN
Commanding

CESWF-PEC

SUBJECT: Joe Lake Master Plan Revision (February 2019)

EXECUTIVE SUMMARY

Joe Pool Lake Master Plan

U.S. Army Corps of Engineers

Prepared by the Regional Planning and Environmental Center (RPEC)

February 2019

PURPOSE

The revision of the 1981 Joe Pool *Lake Master Plan* (hereafter Plan or Master Plan) is a framework built collaboratively to guide appropriate stewardship of U.S. Army Corps of Engineers (USACE) administered resources at Joe Pool Lake over the next 25 years. The 1981 Master Plan for Joe Pool Lake was the original Master Plan and has never been revised. The 1981 Plan has served well past its intended 25-year planning horizon. The lake and dam's primary purposes are flood risk management and water conservation. In addition to these primary missions, USACE has an inherent mission of environmental stewardship of project lands and works closely with Texas Parks & Wildlife Department (TPWD) and the City of Grand Prairie to provide regionally important outdoor recreation opportunities. Joe Pool Lake has a water surface of 6,707 acres at the normal, or conservation pool elevation of 522.0 feet National Geodetic Vertical Datum 1929 (NGVD). Approximately 8,663 acres of Federal land lie above the conservation pool with a shoreline of approximately 60 miles. Joe Pool Dam and Lake Project is one of eight major flood control projects that are an integral part of the USACE plan for flood control and water conservation in the Trinity River Basin. This Plan and supporting documentation provides an inventory, analysis, goals, objectives, and recommendations for USACE lands and waters at Joe Pool Lake, Texas.

PUBLIC INPUT

To ensure a balance between operational, environmental, and recreational outcomes, public and agency input toward the Master Plan was obtained. An Environmental Assessment (EA) was completed in conjunction with the Master Plan to evaluate the impacts of alternatives and can be found in Appendix B.

Approximately 54 individuals, not including USACE personnel, attended the public scoping meeting held at the onset of the process on 23 May 2017 for the Joe Pool Lake Master Plan Revision. During the initial 30-day comment period, a total of 6 written comments were received from stakeholders and the public at large. In addition to the initial public meeting, follow-up workshops were held with TPWD and the City of Grand Prairie. The comments resulting from the initial public meeting and workshops were invaluable in preparing the draft revision of the Plan.

A public meeting to announce the availability of the final draft Master Plan and EA was held on 31 July 2018 followed by a 30-day public comment period. Sixty persons, not counting USACE staff, attended the meeting and written comments were received from 10 individuals and two agencies. All comments and USACE responses are provided in Chapter 7 of the Plan.

RECOMMENDATIONS

The following land classifications changes (detailed in Chapter 8, Table 8.1) were a result of the inventory, analysis, and synthesis of data, documents, and public and agency input. In general, all USACE land at Joe Pool Lake was reclassified either by a change in nomenclature required by regulation or changes needed to identify actual and projected use. The acreage of the conservation pool and USACE land lying above the conservation pool was measured using Geographical Information System (GIS) technology. This software allows for more finely tuned measurements and thus stated acres may vary from official land acquisition records and acreage figures published in the 1981 Master Plan. A more detailed summary of changes and rationale can be found in Chapter 8.

Table ES.1 Change from Prior Land Classification to New Land Classification¹

Prior Land Classifications (1981)	Acres	New Land Classifications	Acres
Project Operations	309	Project Operations	308
Recreation – High Use	3,236	High Density Recreation	4,043
Recreation – High Use/Interim Wildlife ²	1,756		
		Environmentally Sensitive Areas	1,507
Recreation/Wildlife Management – Low Use	3,360	Multiple Resource Management - Low Density Recreation	578
		Multiple Resource Management – Vegetative Management	157
		Multiple Resource Management – Wildlife Management	2,070
Permanent pool	7,470 ³	Permanent pool	6,707 ³
Total	16,131¹	Total	15,370¹
Flowage Easement	1,904	Flowage Easement	1,904

¹The new land classification acreage figures were measured using GIS technology and may vary slightly from prior classifications, and from official land acquisition records. Also, with the exception of

the Project Operations classification, there is no direct relationship between the prior land classifications and the new land classifications. The USACE planning team considered the prior classifications “Recreation – High Use”, and “Recreation – High Use/Interim Wildlife”, to be equivalent to the current classification “High Density Recreation”. The prior classification of “Recreation/Wildlife Management – Low Use” was considered equivalent to one or more of the current sub-classifications under Multiple Resource Management Lands.

²Included within the acreages of Recreation High Use and Recreation High Use/Interim Wildlife is 1,475 acres of Separable Recreation Lands that were acquired for the sole purpose of Recreation.

³The 7,470 acre figure has been used as the conservation pool acreage for many years, but more refined measurements performed as part of the revision of the 1981 Master Plan indicates the conservation pool is 6,707 acres.

PLAN ORGANIZATION

Chapter 1 of the Master Plan presents an overall introduction of Joe Pool Lake. Chapter 2 consists of an inventory and analysis of project resources. Chapters 3 and 4 lay out management goals, resource objectives, and land allocation and classification. Chapter 5 is the resource plan that identifies how project lands will be managed through a resource use plan for each land use classification. This includes current and projected park facility needs, an analysis of existing and anticipated resource use, and anticipated influences on overall project operation and management. Park maps produced by TPWD and Grand Prairie for their respective developed parks are provided in Chapter 5. Chapter 6 details topics that are unique to Joe Pool Lake. Chapter 7 identifies the public involvement efforts and stakeholder input gathered for the development of the Master Plan, and Chapter 8 gives a summary of the changes in land classification from the previous master plan to the present one. Finally, the appendices include information and supporting documents for this Master Plan revision, including Land Classification and Park Plate Maps (Appendix A).

An EA analyzed alternative management scenarios for Joe Pool Lake and has been prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA); regulations of the Council on Environmental Quality; and USACE regulations, including Engineer Regulation 200-2-2: Procedures for Implementing NEPA. The EA is a separate document that informs this Master Plan and can be found in its entirety in Appendix B.

The EA evaluated two alternatives as follows: 1) No Action Alternative, and 2) Proposed Action. The EA analyzed the potential impact these alternatives would have on the natural, cultural, and human environments. The Master Plan is conceptual and broad in nature, and any action proposed in the plan that would result in significant disturbance to natural resources or result in significant public interest would require additional NEPA documentation at the time the action takes place.

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CHAPTER 1 - INTRODUCTION

1.1 GENERAL OVERVIEW

Joe Pool Dam is located at river mile (RM) 11.2 on Mountain Creek, a tributary to the West Fork of the Trinity River. The damsite is located in Dallas County, about 10 miles southwest of the city of Dallas and adjacent to the city of Grand Prairie. The lake extends from Dallas County into Tarrant and Ellis counties (Figure 1). The construction of Joe Pool Dam began on 6 December 1979 and was completed in May 1986, deliberate impoundment began on 7 January 1986.

Joe Pool Dam and Lake Project is an integral part of the USACE plan for flood control and water conservation in the Trinity River Basin. The plan presently consists of eight major flood control projects, known as Benbrook Dam, Bardwell Dam, Grapevine Dam, Joe Pool Dam, Lavon Dam, Lewisville Dam, Navarro Mills Dam, and Ray Roberts Dam. The eight flood control projects in the Trinity River system control approximately 1,591,300 acre-feet (ac-ft) of flood control area. Joe Pool controls 232 square miles of drainage area. USACE operates and maintains the dam and associated facilities, and administers the Federal lands and flowage easements comprising the project through a combination of direct management and leases for park and recreation purposes.

The Trinity River Authority of Texas (TRA), an agency of the State of Texas, serves as the local sponsor for Joe Pool Lake. A water supply storage contract with the TRA was approved 15 June 1977 for 100 percent (142,900 ac-ft) of the conservation storage below elevation 522.0 feet NGVD. TRA assists federal, state, regional and local entities in developing water supply and wastewater projects based on the needs of their populations. In addition to Joe Pool Lake, TRA serves as the local sponsor for several other USACE projects including Bardwell Lake, Navarro Mills Lake, and the Wallisville Saltwater Barrier.

The Master Plan is intended to serve as a comprehensive land and recreation management guide with an effective life of approximately 25 years. The focus of the Plan is to guide the stewardship of natural and cultural resources, and make provision for outdoor recreation facilities and opportunities on federal land associated with Joe Pool Lake. The Master Plan identifies conceptual types and levels of activities, but does not include designs, project sites, or estimated costs. All actions carried out by USACE, other agencies, and individuals granted leases to USACE lands must be consistent with the Master Plan. The Plan does not address the flood risk management or water supply purposes of Joe Pool Lake (see the USACE Water Control Manual for Joe Pool Lake for a description of these project purposes). The Joe Pool Lake Master Plan was last updated in 1981, which is well past the intended planning horizon.

1.2 PROJECT AUTHORIZATION

Joe Pool Lake was authorized for construction in 1965 as a multi-purpose reservoir for flood control, water conservation, recreation, and fish and wildlife management as contained in the River and Harbor Act of 1965 (Public Law [PL] 89-298), in accordance with the total plan of improvement for the Trinity River as outlined in House Document 276 (89th Congress, 1st Session). Originally known as Lakeview Lake, the name was changed on December 31, 1982 by PL 97-400 in honor of the former U.S. Congressman Joe Richard Pool from Dallas, Texas, who served in the U.S. House of Representatives from January 1963 through July 1968. Construction of Joe Pool Dam began December 6, 1979, and was completed in May 1986. Deliberate impoundment began in January 1986 and the conservation pool was filled in May 1989.

1.3 PROJECT PURPOSE

Joe Pool Lake is a multipurpose water resources project designed and operated by USACE for the primary purposes of flood risk management and water conservation within the Trinity River Basin. USACE administers the surrounding federal lands and water surface to provide a variety of public, outdoor recreation opportunities. All recreation facilities on Federal land at Joe Pool Lake are currently leased to and operated and maintained by Texas Parks & Wildlife Department (TPWD) at Cedar Hill State Park, and Grand Prairie at numerous other park areas. Grand Prairie currently operates Lynn Creek, Loyd and Britton Parks and has a park and recreation lease on four additional parcels that are currently undeveloped. Lynn Creek Marina is operated by a private concessionaire in Lynn Creek Park through a sublease agreement with Grand Prairie. USACE also administers the Federal lands and water surface at Joe Pool Lake for environmental stewardship purposes either directly or through the lease agreements with TPWD and Grand Prairie. Refer to map JP18MP-OM-01 in Appendix A for an overview of the lands managed by each managing entity. Environmental stewardship of Federal lands is carried out to recognize and protect important fish and wildlife habitats and species.

1.4 MASTER PLAN PURPOSE AND SCOPE

The Joe Pool Lake Master Plan is the living, flexible, long-term strategic land-use management document that guides the comprehensive management and development of all the project's recreational, natural, and cultural resources. Under the guidance published in Engineering Regulation (ER) 1130-2-550 Change 7, and the accompanying Engineer Pamphlet (EP) 1130-2-550 Change 5, the Plan guides the efficient and cost-effective development, management, and use of project lands. It is a dynamic tool that provides for the responsible stewardship and sustainability of the project's resources for the benefit of present and future generations. The Plan works in tandem with the Operational Management Plan (OMP), which is the task oriented implementation tool for the resource objectives and development needs identified in the Master Plan. The Master Plan guides and articulates the USACE responsibilities pursuant to federal laws. The USACE vision for the future management of the natural resources and recreation program at Joe Pool Lake is set forth as follows:

“The land, water and recreational resources of Joe Pool Lake will be managed to protect, conserve, and sustain natural and cultural resources, especially environmentally sensitive resources, and provide outdoor recreation opportunities that complement overall project purposes for the benefit of present and future generations.”

It is important to note what the Master Plan does not address. Details of design; management and administration; and implementation are not addressed here, but are covered in the Joe Pool Lake OMP. In addition, the Master Plan does not address the specifics of regional water quality, shoreline management (a term used to describe primarily vegetation modification by neighboring landowners), or water level management, nor does it address the operation and maintenance of prime project operations facilities such as the dam embankment, gate control outlet, and spillway. Additionally, the Plan does not address the flood risk management or water conservation purposes of Joe Pool Lake with respect to management of the water level in the lake (see the USACE Water Control Manual for Joe Pool Lake for a description of these project purposes).

The master planning process encompasses the examination and analysis of past, present, and future environmental, recreational and socioeconomic conditions and trends. Within a generalized conceptual framework, the process focuses on the following four primary components:

- Regional and ecosystem needs
- Project resource capabilities and suitabilities
- Expressed public interests that are compatible with Joe Pool Lake’s authorized purposes
- Environmental sustainability elements

The Joe Pool Lake Master Plan, originally published in 1979 as Design Memorandum (DM) 11, then revised as DM 11 in February 1981, was sufficient for prior land use planning and management, but many changes are affecting the region. Outdoor recreation trends, regional land use, population, current legislative requirements, and USACE management policy have evolved. Increased urbanization, fragmentation of wildlife habitat, impacts of climate change, and the growing demand for recreational access and natural resources management has affected the region and Joe Pool Lake. In response to these escalating pressures, a full revision of the 1981 Master Plan is required. The Master Plan revision will update land classifications, include new resource management objectives, and describe future plans proposed by key partners including TPWD and Grand Prairie. The Plan will also inform the management of wildlife and other resource lands for the next 25 years.

1.5 BRIEF WATERSHED AND PROJECT DESCRIPTION

Joe Pool Lake is located in the Mountain Creek watershed in the Upper Trinity River Basin. The headwaters of Mountain Creek begin in the northern part of Johnson County in north central Texas and flow north and northeasterly until it joins the West Fork of the Trinity River at river mile 507.8. The watershed is southwest of Dallas, Texas and comprises portions of Johnson, Ellis, Tarrant, and Dallas Counties. It is roughly 37 miles long, with a maximum width of about 16 miles, and contains a total area of 304 square miles, of which 232 square miles drain into Joe Pool Lake.

Two major left-bank tributaries drain the western part of the Mountain Creek watershed. Walnut Creek joins Mountain Creek just upstream of Joe Pool Dam, while Fish Creek drains into Mountain Creek Lake, which is located approximately 7 miles downstream of Joe Pool Dam. The dam at Mountain Creek Lake is owned and operated by Texas Utilities Electric Company. Minor left-bank tributaries that flow into Mountain Creek are Cottonwood Creek and Lynn Creek. Minor right-bank tributaries that flow into Mountain Creek are O'Guinn Creek, Artesian Creek, John Penn Branch, Baggett Branch, and Hollings Branch. Flow between Mountain Creek Dam and Joe Pool Dam, is affected by backwater from Mountain Creek Lake. Downstream from Mountain Creek Dam flows are affected by backwater from the West Fork of the Trinity River.

Joe Pool Dam consists of a rolled earthfill embankment, a saddle dam, an uncontrolled broad crested spillway, outlet works, low flow system, and flood gates. The total length of the dam is 24,340 feet. The outlet works consist of an approach channel, intake structure with trash rack and gates, flood conduit, low flow conduit, stilling basin, and a discharge channel. The intake tower is located in the lake upstream from the dam embankment station. A 10.5 feet diameter flood conduit running from the tower passes through the embankment and is 660 feet long from the intake tower to the stilling basin portal.

Official real estate records show the total area acquired in fee simple was 15,067 acres. Flowage easements were required for 1,904 acres in the upper reaches of the reservoir, which would be subject to induced backwater flooding. Land up to elevation 541.0 NGVD, 5 feet above the top of the flood control pool, was acquired in fee simple to allow for the operation of Joe Pool Lake. Where the taking line at this elevation was not at least 300 horizontal feet from the flood control pool, the line was reset to provide a minimum ownership width of 300 feet. At the normal or conservation pool elevation of 522.0 NGVD, the lake has approximately 60 shoreline miles and a surface area of 6,707 acres.

There are eight public parks currently designated at Joe Pool Lake, four of which are undeveloped. One of the parks, Cedar Hill State Park, is operated and maintained by the Texas Park and Wildlife Department and frequently records one of the highest annual visitations of any state park in Texas. The other seven parks are leased to the City of Grand Prairie.



Figure 1.1 Vicinity Map of Joe Pool Lake

1.6 DESCRIPTION OF RESERVOIR

Joe Pool Lake is, by comparison to many USACE lakes, a small to medium size reservoir with a normal or conservation pool of 6,707 surface acres at elevation 522.0 NGVD. The depth of the lake near the outlet works is approximately 65 feet, but depths decrease as one moves south from the dam. The top of the flood control pool is elevation 536.0 NGVD and the uncontrolled spillway crest is at elevation 541.0 NGVD. The lake was designed to allow the accumulation of 38,000 acre-feet of sediment during the 100 year life of the reservoir, but as of the date of this Master Plan, no sedimentation surveys have been conducted to determine the degree of sediment

accumulation. See Table 1.2 for pertinent project data. The northeast shoreline of the lake is the home of 1,943-acre Cedar Hill State Park. This shoreline is a remarkable topographic feature and is the point of convergence for two ecosystems, the blackland prairie to the west and the rugged limestone escarpment to the east. The limestone escarpment rises to elevation 850 NGVD and is reminiscent of the Texas hill country. The remainder of the perimeter lands around the lake have less dramatic topography and are dominated by old agricultural fields interspersed with small streams and drainages.

1.7 PROJECT ACCESS

Joe Pool Lake is easily accessed by several primary, secondary and tertiary roads. The two main east-west access highways include Interstate Highway (IH) 20 located only two miles north of the dam and U.S. (US) Route 287 that crosses flowage easement adjacent to Mountain Creek in the upper reaches of the lake. State Highway (SH) 360 and US Route 67 provide north-south access on the west and east side of the lake respectively. Lakeridge Parkway provides convenient access to Lynn Creek Park and the south end of Cedar Hill State Park. Belt Line Road provides good access to the north end of Cedar Hill State Park.

The North Central Texas Council of Governments (NCTCOG) coordinates with cities, counties and transportation partners to plan road, transit, bicycle and pedestrian transportation improvements for 16 counties comprising the NCTCOG and serves as the Metropolitan Planning Organization for the Dallas-Fort Worth Area. NCTCOG's Mobility 2040 plan was used as a reference document for this Master Plan. Items recommended for implementation in the Mobility 2040 plan that are of significance to the area surrounding Joe Pool Lake include the following:

- Widening Lakeridge Parkway, a regionally important arterial, from the current 2 lanes to 6 lanes by 2040
- Widening Camp Wisdom Road, a regionally important arterial, from the current 2 lanes to 4 lanes by 2040
- Construction of light rail lines that roughly parallel US 287 on the south side of the lake and US 67 on the east side of the lake
- Addition of new or additional toll road capacity to SH 360 on the west side of the lake
- Adding links to the Regional Veloweb that will serve the area encircling Joe Pool Lake.

National USACE policy set forth in ER 1130-2-550, Appendix H, states that USACE lands will, in most cases, only be made available for roads that are regional arterials or freeways (as defined in ER 1130-2-550). All other types of proposed roads, including driveways and alleys, are generally not permitted on USACE lands. The proposed expansion or widening of existing roadways on USACE lands will be considered on a case-by-case basis.

1.8 PRIOR DESIGN MEMORANDA

Design Memorandums were prepared from 1968 thru 1985 setting forth design criteria for all aspects of the project including the prime flood risk management facilities, real estate acquisition, road and utility relocations, reservoir clearing, and the master plan for recreation development and land management. A few supplements and project related reports and manuals were added after 1985. Table 1.1 lists the Design Memoranda as well as other manuals and reports for Joe Pool Lake.

Table 1.1 Design Memoranda, Manuals and Reports – Joe Pool Lake

	Title	Date
1.	Lakeview Lake - Design Memorandum No. 1 - Hydrology - Supplement No. 1 - Supplement No. 2 - Supplement No. 3 - Supplement No. 4	October 1968 November 1969 September 1974 January 1979 January 1979
2.	Lakeview Lake - Design Memorandum No. 5 - Site Selection	November 1968
3.	Lakeview Lake - Design Memorandum No. 3 - Availability of Materials	February 1969
4.	Lakeview Lake - Design Memorandum No. 4 - General - Supplement No. 1 - Supplement No. 2 - Supplement No. 3	December 1969 October 1970 September 1974 March 1979
5.	Design Memorandum No. 5 - Real Estate Lands for Construction and Reservoir Areas	December 1969
6.	Design Memorandum No. 6 - Land Requirements Plan - Public Use	January 1970
7.	Design Memorandum No. 7 - Project Buildings, Overlook, and Access Road	November 1970
8.	Design Memorandum No. 7 - Project Building, Overlook, Access Road, and Recreation Facilities (revised) - Supplement No. 1 - Supplement No. 2 - Supplement No. 2 (revised) - Supplement No. 3	January 1979 April 1982 May 1983 July 1984 April 1987
9.	Design Memorandum No. 8 - Relocation of Texas State FM Road 1382 - Supplement No. 1	July 1971 October 1978
10.	Design Memorandum No. 9 - Embankment and Spillway - Supplement No. 1	April 1980 April 1981
11.	Design Memorandum No. 10 - Relocations - Dam Construction Area	March 1975
12.	Design Memorandum No. 11 - Master Plan	June 1979
13.	Design Memorandum No. 11 - Master Plan (revised)	February 1981

	Title	Date
	- Supplement No. 1 - Supplement No. 2	November 1984 July 1989
14.	Design Memorandum No. 12 - Relocate TESCO Electric Transmission Lines - Lakeview Lake area	June 1984
15.	Design Memorandum No. 12 - Relocate TESCO Electric Transmission Lines - Lakeview Lake area	June 1984
16.	Design Memorandum No. 13 - Relocate TESCO Electric Transmission Lines - Lakeview Lake area	July 1983
17.	Design Memorandum No. 14 - Relocate SW Bell Telephone Lines - Lakeview Lake area	August 1984
18.	Design Memorandum No. 15 - Relocate T.P. & L Transmission Lines - Lakeview Lake area	August 1982
19.	Design Memorandum No. 16 - Relocation of City Streets and County Roads - Supplement No. 1 - Supplement No. 2	April 1980 August 1982 May 1984
20.	Design Memorandum No. 19 - Southern Pacific Railroad Relocation	February 1981
21.	Design Memorandum No. 20 - Mobil Oil Pipeline Relocation	December 1980
22.	Design Memorandum No. 21 - Lone Star Gas Pipeline Relocation	December 1980
23.	Design Memorandum No. 22 - Relocation of FM Road 661 - Supplement No. 1	January 1980 July 1984
24.	Design Memorandum No. 23 - Clearing and Sedimentation and Degradation Ranges	March 1983
25.	Design Memorandum No. 24 - Outlet Works - Supplement No. 1 (Initial Embankment)	November 1978 February 1979
26.	Design Memorandum No. 25 - Recreation Facilities	December 1982
27.	Design Memorandum No. 26 - Sewer Treatment Plant Relocation	June 1983
28.	Design Memorandum No. 27 - Relocate Tarrant County Water Control & Improvement District No. 1 Pipeline Facilities	March 1983
29.	Design Memorandum No. 28 - Relocation of Hill County Electric CO-OP Distribution Facilities in Joe Pool Lake area	February 1983
30.	Design Memorandum No. 29 - Reservoir Filling Plan	November 1985
31.	Report on Restudy of Authorized Lakeview Lake (Mountain Creek Watershed)	June 1973
32.	Environmental Enhancement Theme Alternatives (Draft)	June 1978
33.	Joe Pool Lake - Completion of Embankment and Spillway	February 1988

	Title	Date
34.	Joe Pool Lake - Operation and Maintenance Manual	September 1991
35.	Joe Pool Lake - Flood Emergency Plan	September 1993

Source: USACE

1.9 PERTINENT PROJECT INFORMATION

The following table provides pertinent information regarding key reservoir elevations and storage capacity at Joe Pool Lake.

Table 1.2 Elevations and Water Storage Capacity

Feature	Elevation (Feet NGVD)	Lake Area (Acres)	Storage (Acre-Feet)	Runoff (inches)
Top of Dam	564.4	–	–	–
Maximum Design Water Surface Elevation (1979 Study)	559.4	18,600	642,400	51.92
Spillway Crest (1979 Study)	541.0	12,470	362,700	29.31
Top of the Flood Control Pool (1979 Study)	536.0	10,940	304,000	24.57
Top of the Conservation Pool (1979 Study)	522.0	7,470	176,900	14.30
Sediment Reserve	–	–	38,000	–
Maximum Tailwater	474.9	–	–	–
Streambed	456.0	–	0	–

Source: USACE

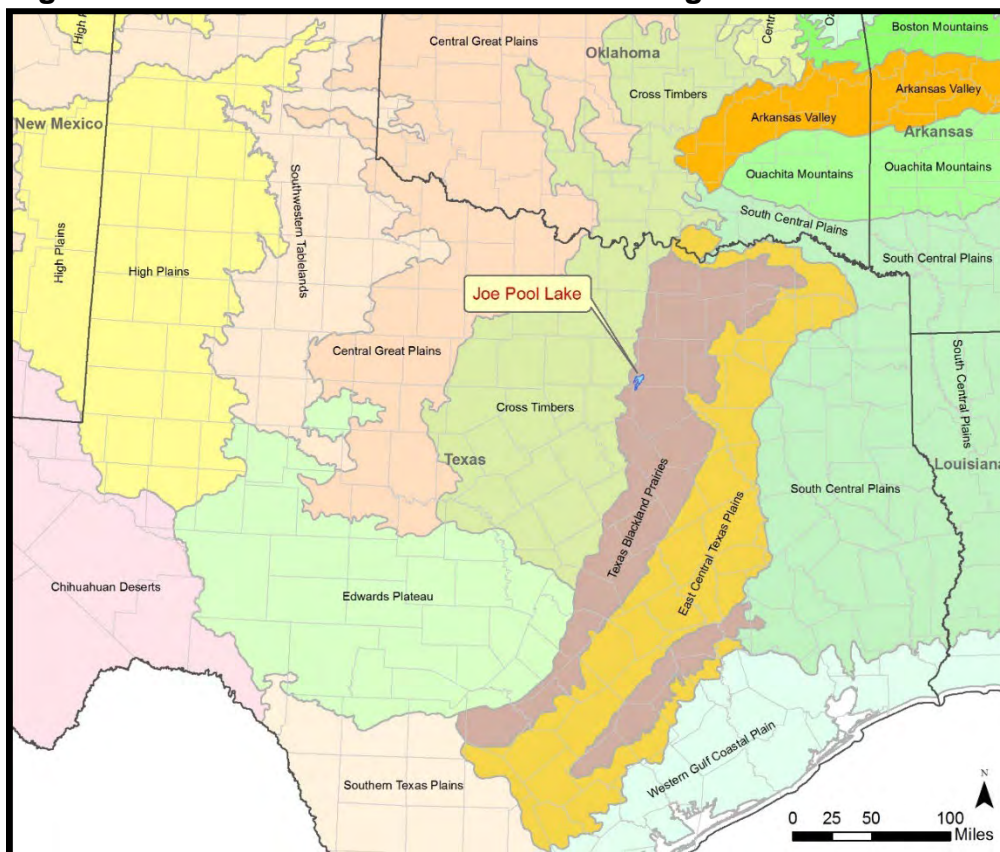
CHAPTER 2 - PROJECT SETTING AND FACTORS INFLUENCING MANAGEMENT AND DEVELOPMENT

2.1 PHYSIOGRAPHIC SETTING

2.1.1 Ecoregion Overview

Joe Pool Lake is in the Texas Blackland Prairies ecoregion characterized by fine-textured, clayey soils and predominantly prairie vegetation and is divided into distinct Northern and Southern regions. Joe Pool Lake is located in the Northern Blackland Prairie, which stretches over 300 miles from Sherman in the north to San Antonio in the south. Prairie vegetation includes various grasses and forbs, while the bottomland hardwood forests is predominantly oak and other hardwood trees. Elevations range from approximately 95 to 850 NGVD.

Figure 2.1 Joe Pool Lake within Texas Ecoregions



Source: EPA

Before Anglo settlement, the region was habitat for bison, pronghorn antelope, mountain lion, bobcat, ocelot, black bear, collared peccary, deer, coyote, fox, badger, river otter, and many species of birds. Much of the original prairie and forest has been

converted to cropland and pasture or cleared for urbanization, with less than one percent of the original vegetation remaining today.

2.1.2 Climate

Located at the intersection of Dallas, Tarrant, and Ellis counties, the local climate is a warm, temperate, humid, subtropical climate. Summers are usually hot and often humid during the day and warm at night, while winter temperatures are normally mild with short durations of freezing temperatures. The average annual temperature is 66 degrees (°) Fahrenheit (F), while average low and high temperatures range from 37°F in January to 96°F in August. The lowest minimum-recorded temperature is -8°F and the highest maximum 113°F. The area has an average of 332 frost-free days, while the growing season between the last and first frost averages 247 days; but this can vary significantly from year to year. The average first freeze occurs in late-November and the average last freeze occurs in mid-March. The area is prone to extreme weather including hailstorms and tornados.

Table 2.1 Temperature

Temperature Period of Record 1981-2010	
Average Low January Temperature	36°F
Average High August Temperature	96°F
Average Annual Temperature	66°F
Average Days With Temperature ≤ 32°	33 days
Average Days With Temperature ≥ 100°	18 days

Source: Weather.gov

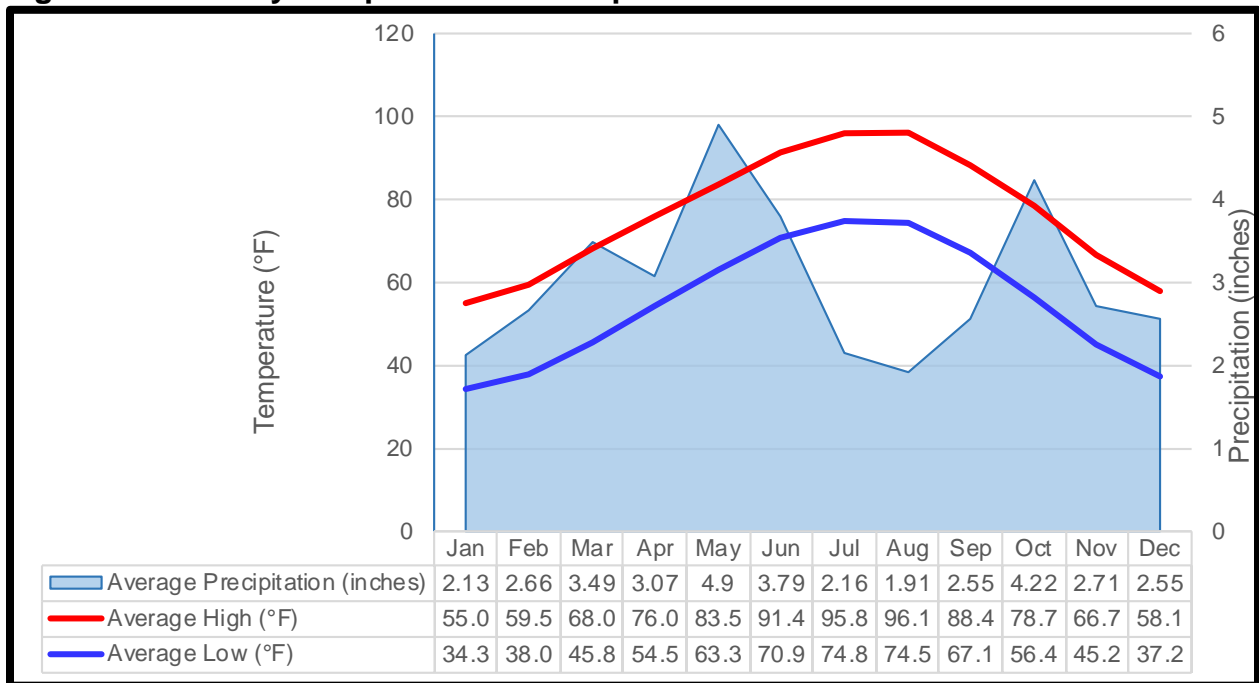
Annual precipitation for Joe Pool Lake is 36.1 inches per year. Although precipitation can occur during every month of the year, more precipitation typically occurs during spring and fall with May averaging the most precipitation. The region averages 1.7 inches of snowfall annually, but many years receive very little to no measurable snowfall. Rainfall can occur through short rainstorms or even torrential thunderstorms delivering over 5 inches of rain in a 24-hour period. Those torrential storms, when combined with poorly draining soil, can lead to significant runoff and a threat of flooding.

Table 2.2 Precipitation

Precipitation Period of Record 1921-2010	
Mean Annual Precipitation	36.1 inches
Maximum Annual Precipitation	62.6 inches (2015)
Minimum Annual Precipitation	17.9 inches (1921)
Maximum Monthly Rainfall	17.6 inches (Apr 1922)
Maximum 24-Hour Rainfall	5.9 inches (Oct 1959)
Average Annual Snowfall	1.7 inches
Maximum Snowfall (by Season)	17.6 inches (1977-1978)

Source: Weather.gov and USACE Water Control Manual

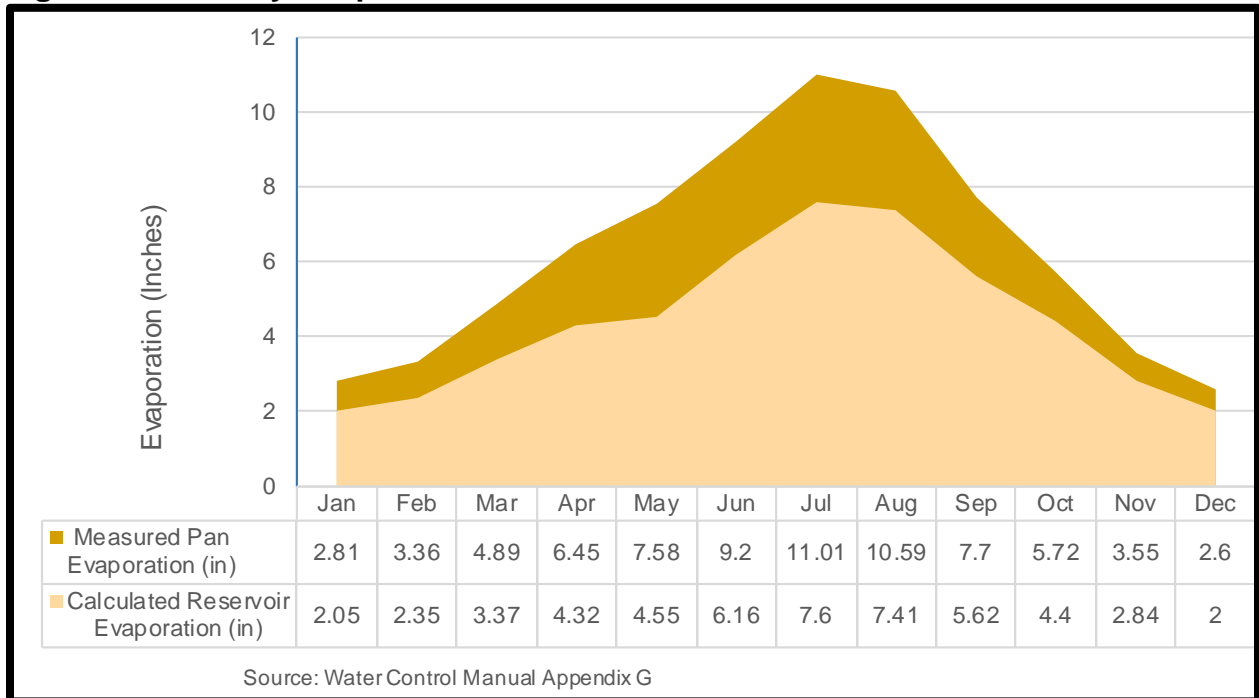
Figure 2.2 Monthly Temperature & Precipitation



Source: NOAA & National Weather Service

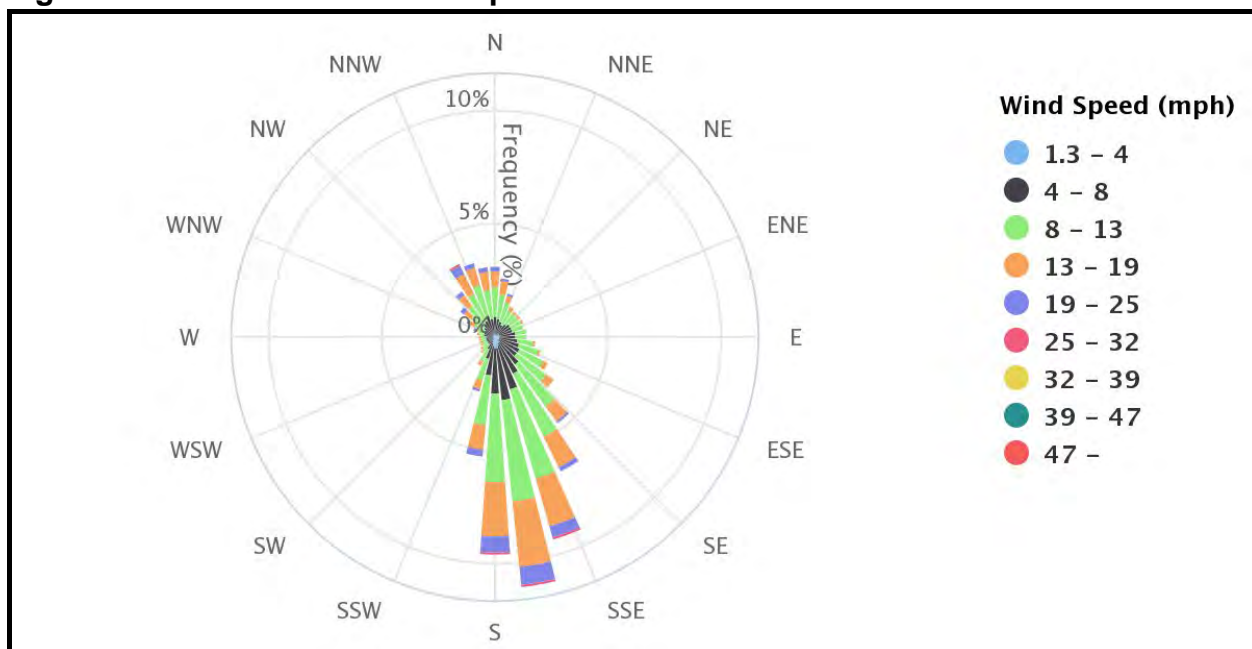
Evaporation data has been collected at Joe Pool Lake with an evaporation pan from 1989 to present. Average annual evaporation from the lake is about 54 inches. The highest recorded pan evaporation was in 2011 at 96.89 inches, while the lowest recorded pan evaporation was 63.6 in 1992. The evaporation pan has a higher rate of evaporation than the lake, so a coefficient is used to estimate the actual lake evaporation. The major factors affecting the rate of evaporation are temperature, humidity, and wind.

Figure 2.3 Monthly Evaporation



The prevailing winds over the watershed are from the south during the spring, summer, and fall months, while northerly winds prevail during the winter months. Severe winds have been experienced near Joe Pool Lake. Gusts up to 110 miles per hour were recorded near the National Weather Service Station in Lilian, approximately 20 miles southwest of the dam site on 23 April 2003. Tornadoes are rare within the watershed, but have been known to occur within Dallas, Ellis, and Tarrant Counties.

Figure 2.4 Wind Direction and Speed



Source MRCC Cli-MATE Tool, [Wind Rose from Arlington Station, 1997-2017

The topic of worldwide climate change, including the causes and extent, continues to be studied by the scientific community and world governments. USACE has prepared a number of policies in response to past Executive Orders and general concern over sea level rise. These policies are explained on the USACE website at https://www.usace.army.mil/corpsclimate/climate_policies.

2.1.3 Geology

The geology around Joe Pool Lake is primarily composed of three named geologic formations: Alluvium, Fluviate Terrace Deposits, and Eagle Ford Group. The oldest shale and limestone layers were laid down during the Cretaceous Period, while the gravel, clay, sand, and silt were laid down periodically since the Cretaceous Period. The alluvium formation is from more recent alluvial sedimentary deposits from the local creeks which feed into the Trinity River. The following are descriptions of each formation:

Alluvium (USGS symbol Qal): The alluvium formation is composed of mostly flood-plain deposits including indistinct low terrace deposits; gravel, sand, silt, silty clay, and various forms of organic matter. It was formed during the Quaternary Period, which is the last 2.6 million years, and specifically the Holocene Epoch, which is the most recent 11,700 years of that period.

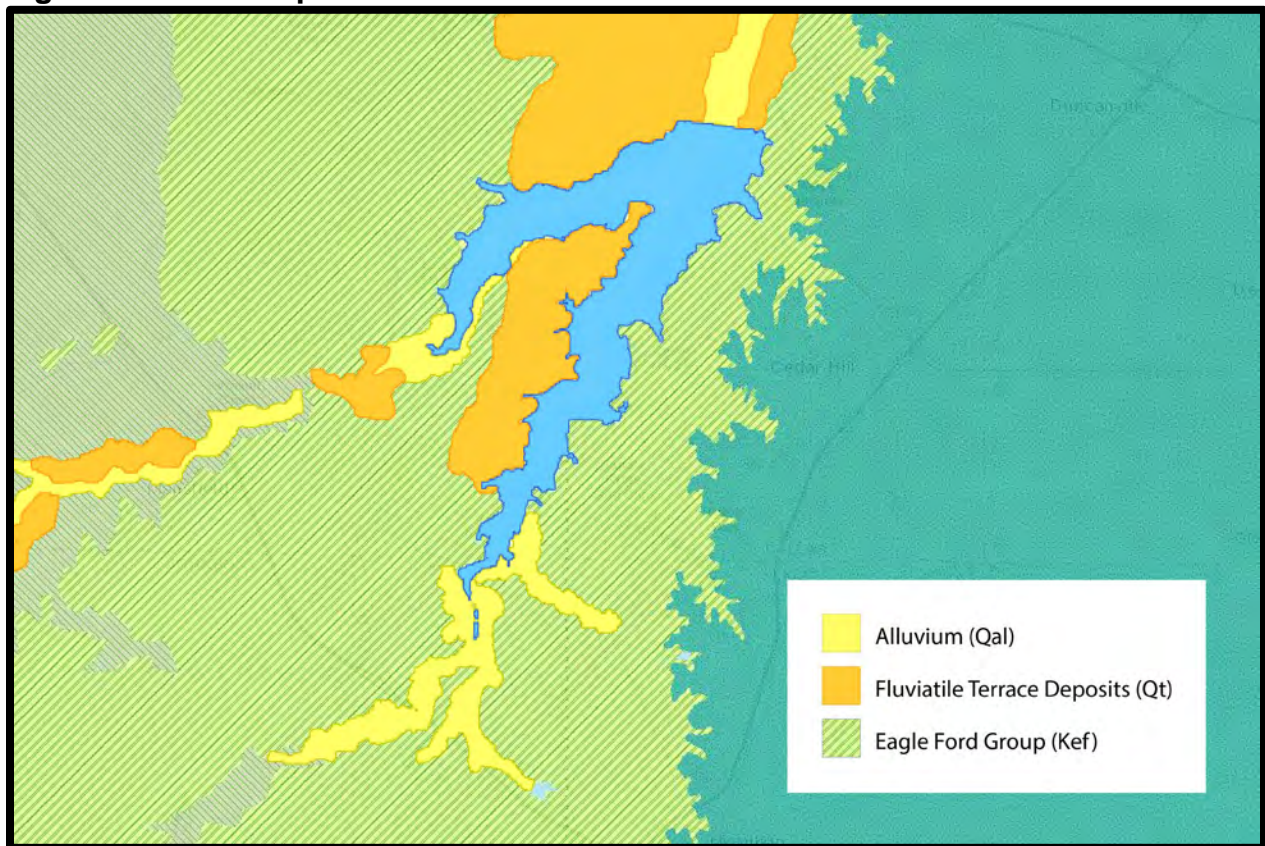
Fluviate Terrace Deposits (USGS symbol Qt): This formation was formed during the Quaternary Period which includes the last 2.6 million years, but periodically during the Pleistocene Epoch, which ranges from 2.6 million years ago until 11,700

years ago. The Fluvial Terrace Deposits are mostly gravel, sand, silt, and clay; which often form well-defined layers of different ages separated by solid lines.

Eagle Ford Group (USGS symbol Kef): The Eagle Ford Group was formed in the late Cretaceous Period, between 66 million and 100 million years ago. The formation is part of the Gulfian Series, which was deposited when the area was inundated by the Gulf of Mexico. The deposits include a range of sandstone, limestone, and shale; bituminous, selenitic, with calcareous concretions and large septaria; sandstone and sandy limestone in the upper parts, platy, burrowed, medium to dark gray. The formation ranges in thickness from 200-300 feet thick, and often contain marine fossils from the Cretaceous Period. Overlying the Eagle Ford along the eastern margin of the park is the Austin Formation. The Austin consists of well-indurated layers of chalk which form the impressive White Rock Escarpment. Only a small portion of the park exhibits exposures of the Austin Chalk.

The region is known to have natural resources including oil and natural gas, and those mostly in the Eagle Ford Group. Hydrocarbons are mostly found in less permeable layers which are normally retrieved through hydraulic fracturing and horizontal drilling. Section 2.2 discusses natural resources in more detail.

Figure 2.5 Soils Map for Joe Pool Lake



Source: USGS Texas Geology Map

2.1.4 Topography

Joe Pool Lake and its tributaries are located in the floodplains and Low Terraces subdivisions of the Northern Blackland Prairies ecoregion, which have nearly flat plains to gently rolling hills with a few shallow tributary valleys. The combination of minimal grade changes and poorly draining, clay-filled soils often led to thousands of gilgai, which are small depressions containing pools of shallow water. Much of the original topography has been modified for agriculture and later urban growth. Walnut Creek drops from an elevation of 760 NGVD at its source to 456 NGVD at the base of Joe Pool dam, and the creek continues toward its confluence with the West Fork at 390 NGVD. To the east of the lake are several bluffs that range in elevation from 750 to 800 NGVD.

2.1.5 Hydrology and Groundwater

The Trinity River Basin is the third largest river basin in Texas by average volume and the largest river basin that both begins and ends in the state. The Trinity River provides water to over half of the state's population, serving two major population centers: Dallas/Fort Worth in the north and Houston in the South. The basin has an overall length of 360 miles, where the Trinity River meanders a total of 715 miles before

draining into the Galveston Bay and estuary system, a very productive ecosystem and commercial fishery. Within the Mountain Creek subwatershed, Walnut Creek was impounded to form Joe Pool Lake, while Mountain Creek and several minor creeks also drain into to the lake. Below the dam, Mountain Creek continues to flow northeast towards Mountain Creek Lake and eventually into the West Fork of the Trinity River.

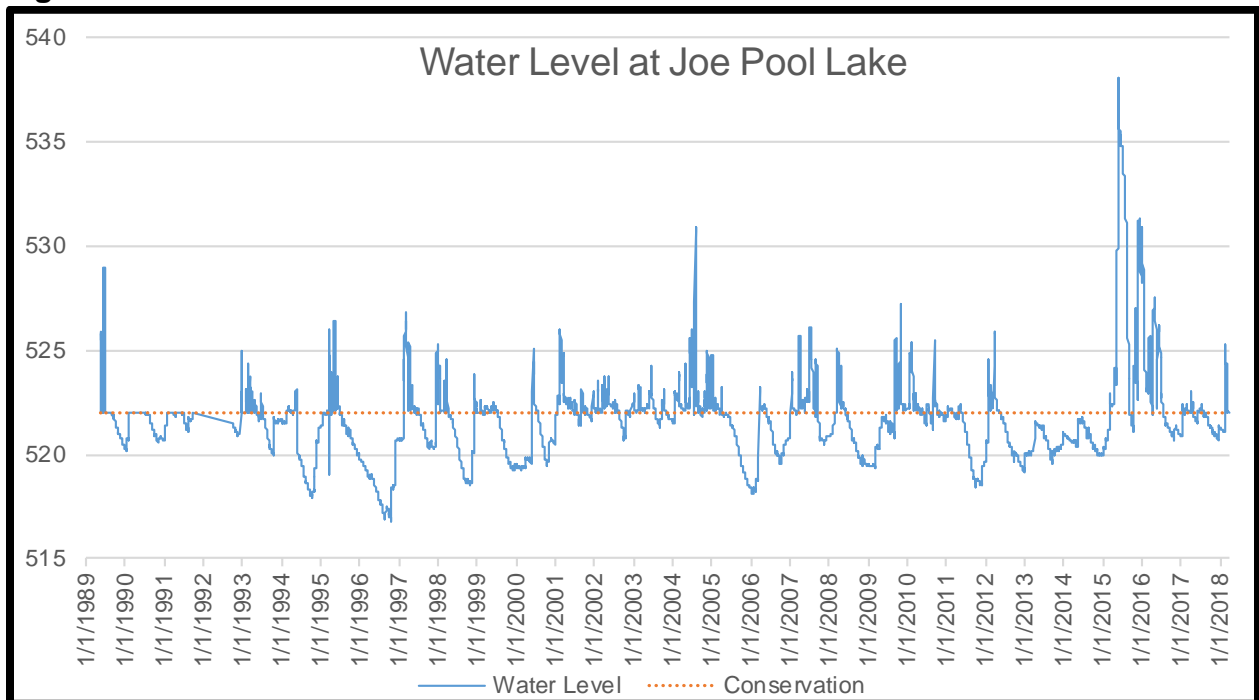
Deep below Joe Pool Lake lies the Trinity Aquifer, a major aquifer, and specifically the Woodbine (subcrop) aquifer, which is a minor aquifer. Water in the aquifer is very fresh with slight to moderate salinity and dissolved solids. The aquifer discharges to several natural springs on the western edge of the aquifer, but most springs discharge at less than 10 cubic feet per second. The aquifer is one of the most extensive and highly used groundwater resources in the state, and is used primarily as a municipal water source, but also for irrigation, livestock, and other domestic uses. Recently, the aquifer has suffered some of the state's worst water level declines, both lowering the depth and reducing the pressure of water within the aquifer. This has been due to recent droughts combined with increasing pumping for municipal water use. The regional water planning group has recommended that municipalities start developing other water sources, including increasing surface water use as municipal demand for water is expected to increase. The Trinity River Authority of Texas (TRA) has contracted with USACE for all water supply storage in Joe Pool Lake and has committed all water supply to the cities of Cedar Hill, Grand Prairie, Midlothian and Duncanville. TRA, in cooperation with Cedar Hill, Grand Prairie and Duncanville constructed a water intake structure on the east side of the lake, but has not yet activated the structure. Currently, only the city of Midlothian is withdrawing water from the lake.

The Mountain Creek watershed is subject to three general types of flood-producing rainfall: thunderstorms, frontal rainfall, and tropical weather patterns. The topography, soils, and typical rainfall patterns of the watershed lead to rapid runoff and flash floods. Floods can occur frequently and at almost any time of year. Generally, the highest 24-hour and monthly precipitation periods have occurred during major regional thunderstorms. However, there are some instances of heavy precipitation resulting from local thunderstorms. Mountain Creek's large floods are generally long-duration type having two or more peaks spaced as close as ten days apart. However, it is possible that large peak (sharp rise in water level over a shorter period) and volume floods (more gradual rise in water level over a longer period) could occur in about two weeks in duration.

Impounding of water in Joe Pool Lake began on 7 January 1986. The conservation pool was first filled to 522 NGVD on 18 May 1989, and the water level is documented in Figure 2.6. Just shortly thereafter, the lake would be challenged with significant rainfall over the next six weeks, leading to a record high pool on 26 June 1989 at 528.97 NGVD. That record would stand until 31 July 2004 when storms raised the pool height to 530.95 NGVD. That record would again last until the pool height reached 538.03 NGVD on 30 May 2015. May through July of 2015 saw continued rainfall which kept the water level well above the conservation pool, not returning to 522 NGVD until 13 September 2015. Just two months later, the area again saw significant

rainfall in November and into December, leading to a new surge to 531.29 NGVD on 9 December 2015. Although this was not a new record, the short period between significant storms producing very high pool levels has proven the importance and effectiveness of Joe Pool Lake in flood risk management. The flood damages prevented in the Mountain Creek basin by Joe Pool Dam and Lake during fiscal year 2015 were estimated to be \$281,995,300. The cumulative damages prevented since the completion of the project in 1986 through 2015 are \$4,229,725,900, and the average is \$141 million per year. Most of the damages prevented are along the Trinity River through Dallas, Texas.

Figure 2.6 Water Level at Joe Pool Lake



The region has experienced several dry periods and droughts since Joe Pool Lake was impounded causing the water level to fall far below the conservation pool on several occasions. On 30 September 1994 the lake experienced its first significant drawdown when the level reached 517.99 NGVD (83.8% of conservation pool). From July 1995 through February 1997, the area experienced a prolonged drought, causing the pool to drop to 516.77 NGVD (79.1%) on 20 October 1996; with the pool not recovering to 522 NGVD (100%) until 2 February 1997. These and other significantly low water levels at Joe Pool Lake are documented in Table 2.3.

Table 2.3 Low Water Levels below 90% Capacity at Joe Pool Lake

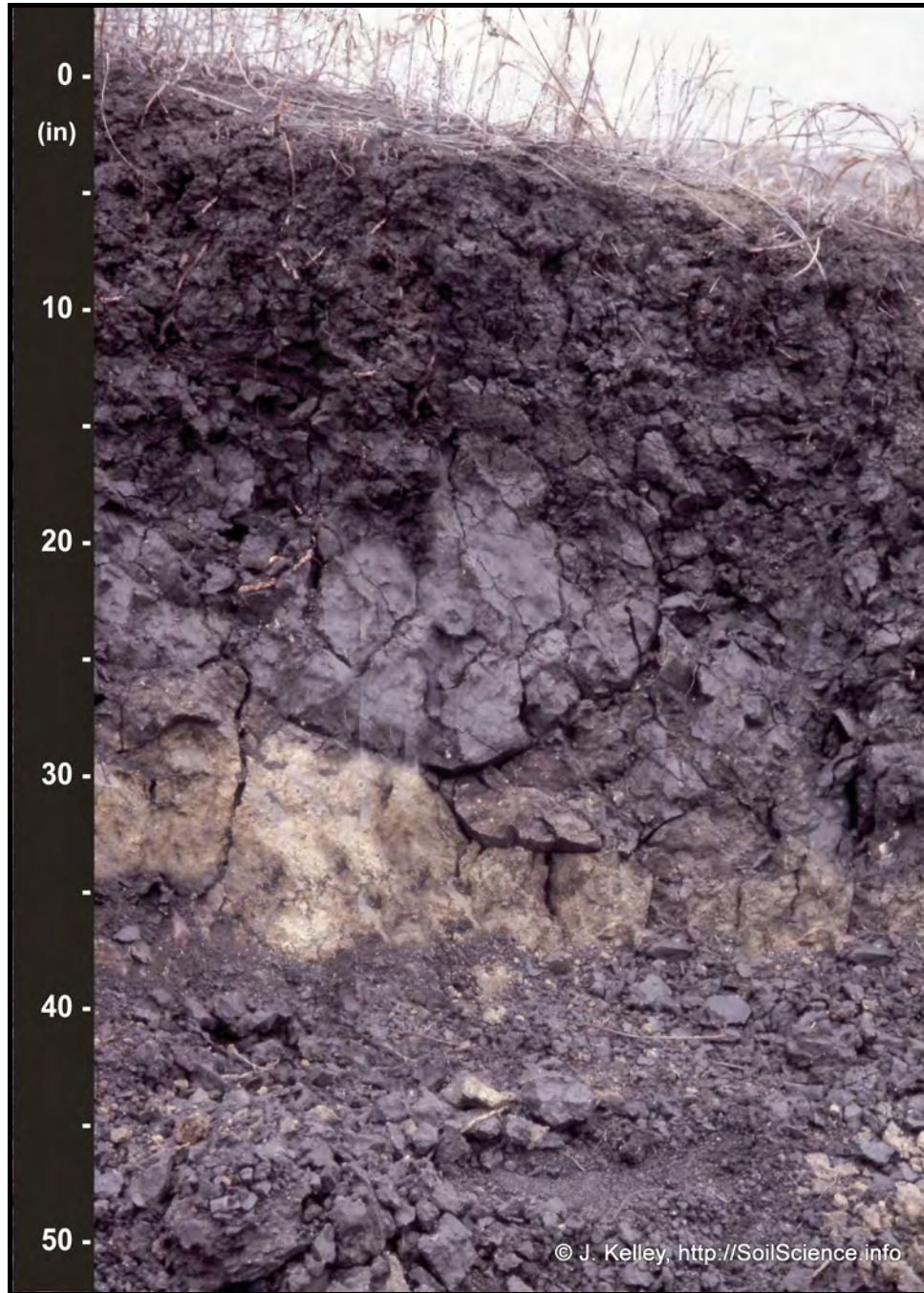
Date	Elevation (Feet, NGVD)	Percent of Capacity
30 September 1994	517.99	83.8
4 April 1996	518.83	87.0
27 August 1996	516.87	79.5
20 October 1996	516.77	79.1
10 October 1998	518.55	85.9
8 December 1999	519.21	88.6
4 February 2000	519.35	89.1
15 October 2000	519.51	89.7
21 January 2006	518.08	84.1
24 February 2006	518.19	84.5
9 October 2006	519.50	89.7
4 January 2009	519.46	89.5
4 March 2009	519.36	89.1
8 October 2011	518.46	85.6
24 December 2012	519.19	88.4
19 September 2103	519.52	89.8

Source: Water Control Manual and waterdatafortexas.org & TWDB

2.1.6 Soils (Soil Taxonomy)

The main soil series around Joe Pool Lake is the Houston Black Series which is very thick and normally found on level to slightly sloping areas, is slowly permeable, and contains dark, fine, sticky clay, as seen in Figure 2.7. The highly expansive clays are classified as Vertisols, which shrink and swell with changes in moisture content. As the soil swells it becomes less permeable, leading to ponding in level areas and increased runoff where there is a slope. When dry, the soil can develop deep fissures due to the shrinkage. The soil often holds many nutrients for plants including calcium, magnesium, and potassium. While Houston Black soil originally contained native prairie vegetation, the soil has been used for modern agriculture, growing sorghum, cotton, corn, grains, and forage grasses.

Figure 2.7 Houston Black Clay, by John A. Kelley, USDA Natural Resources Conservation Service



A soil survey by the Natural Resource Conservation Service (NRCS) shows there are seven out of the eight possible general classifications (Classes I through Class VIII) occurring in the reservoir area, although most is one of five classifications (Class II through VI). The erosion hazards and limitations for use increase as the class number increases. Class I has few limitations, whereas Class VIII has many. The soil class data for project lands is provided in Table 2.4. This data is compiled by the NRCS and is a standard component of natural resources inventories on USACE lands. This, and other

inventory data, is recorded in the USACE Operations and Maintenance Business Information Link (OMBIL).

Table 2.4 NRCS/USDA Soil Classification

Class	Acreage	Percentage	Description
I	0	0.0%	Class I (1) soils have slight limitations that restrict their use.
II	2,021	26.3%	Class II (2) soils have moderate limitations that reduce the choice of plants or require moderate conservation practices.
III	2,080	27.1%	Class III (3) soils have severe limitations that reduce the choice of plants or require special conservation practices, or both.
IV	562	7.3%	Class IV (4) soils have very severe limitations that restrict the choice of plants or require very careful management, or both.
V	1,008	13.1%	Class V (5) soils have little or no hazard of erosion but have other limitations, impractical to remove, that limit their use mainly to pasture, range, forestland, or wildlife food and cover.
VI	2,027	26.4%	Class VI (6) soils have severe limitations that make them generally unsuited to cultivation and that limit their use mainly to pasture, range, forestland, or wildlife food and cover.
VII	21	<0.1%	Class VII (7) soils have very severe limitations that make them unsuited to cultivation and that restrict their use mainly to grazing, forestland, or wildlife.
VIII	3	<0.1%	Class VIII (8) soils and miscellaneous areas have limitations that preclude their use for commercial plant production and limit their use to recreation, wildlife, or water supply or for esthetic purposes.

Source: OMBIL; Class descriptions from NRCS/USDA

2.2 ECOREGION AND NATURAL RESOURCE ANALYSIS

2.2.1 Natural Resource Stewardship and Analysis

The natural resources present at Joe Pool Lake include the water, wetlands, soil, vegetation, and fish and wildlife, including those species listed as endangered or threatened by the U.S. Fish and Wildlife Service (USFWS) and the state of Texas. The stewardship of natural resources adheres to ecosystem management principles as described in the USACE regulations ER and EP 1130-2-540. Effective stewardship is imperative to the sustainability and use of project resources. The ecoregion and the local natural resources are described in further detail in the following section.

As part of the master planning process, USACE completed a habitat study for the EA in Appendix B) based on TPWD's Wildlife Habitat Appraisal Procedure (WHAP). The WHAP was developed to allow a qualitative and holistic evaluation of wildlife habitat for a particular location without requiring significant time for field work or compiling data. A total of 69 points were surveyed from the known major habitat types throughout USACE lands around the lake to assess the quality of the habitat around Joe Pool Lake. The WHAP noted just three points with very high quality habitat, which support riparian and mixed forest habitats with very high diversity. The WHAP also noted five points with high scores indicating quality habitat with good diversity. Some of those sites were also associated with ongoing conservation and restoration efforts, while surrounding areas are also undergoing habitat succession. The results of the WHAP provided critical data to identify unique, diverse, or sensitive environments around the lake for the EA as well as updating land classifications for this master plan. The WHAP Report is included in Appendix C.

2.2.2 Vegetative Resources

USACE regulations and policy require a basic inventory of the vegetation at all operational projects. This inventory, referred to in EP 1130-2-540 as a Level 1 inventory, classifies the vegetation in accordance with the National Vegetation Classification System (NVCS) down to the Sub-Class level which is a very broad classification level. The inventory data, presented in Table 2.5 is recorded in the USACE national database referred to as OMBIL and is useful in providing a general characterization of the vegetation on all operational projects. Daily management of USACE lands requires more detailed knowledge of the vegetation down to the Association level within the NVCS, and for most management prescriptions, down to the individual species level of dominant vegetation.

Table 2.5 Vegetation Classification and Acres at Joe Pool Lake

Order	Class	Sub-class	Total Sub-Class Acreage	Sustainable Acres	Transitioning Acres	Total Condition Acres
Non-Vegetated	Non-Vegetated	Non-Vegetated	6,707	6,707	0	6,707
Herb Dominated	Herbaceous Vegetation	Hydromorphic Rooted Vegetation	19	19	0	19
Herb Dominated	Herbaceous Vegetation	Perennial Graminoid Vegetation (Grassland)	1,091	1,091	100	1,191
Tree Dominated	Closed Tree Canopy	Deciduous Closed Tree Canopy	2,043	2,043	0	2,043

Order	Class	Sub-class	Total Sub-Class Acreage	Sustainable Acres	Transitioning Acres	Total Condition Acres
Tree Dominated	Closed Tree Canopy	Evergreen Forest	77	77	0	77
Tree Dominated	Closed Tree Canopy	Mixed Evergreen-Deciduous Closed Tree Canopy	67	67	0	67
Tree Dominated	Open Tree Canopy	Deciduous Open Tree Canopy	4,325	4,325	0	4,325

Source: OMBIL Report Project Site Vegetation Classification and Condition Records for Fiscal Year 2017

The Texas Blackland Prairies ecoregion originally contained a diverse range of prairie species including little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardi*), yellow Indiangrass (*Sorghastrum nutans*), switchgrass (*Panicum virgatum*), eastern gamagrass (*Tripsacum dactyloides*), tall dropseed (*Sporobolus compositus*), asters (*Aster spp.*), prairie bluet (*Stenaria nigricans*), prairie clovers (*Dalea spp.*), and coneflowers (*Echinacea spp.*). Bottomland hardwood forests are not as prevalent, but where they occur contain bur oak (*Quercus macrocarpa*), Shumard oak (*Quercus shumardii*), post oak (*Quercus stellata*), blackjack oak (*Quercus marilandica*), green ash (*Fraxinus pennsylvanica*), pecan (*Carya illinoensis*), cedar elm (*Ulmus crassifolia*), American elm (*Ulmus americana*), Winged elm (*Ulmus alata*), sweetgum (*Liquidambar styraciflua*), sugar hackberry (*Celtis laevigata*), and eastern cottonwood (*Populus deltoides*). Some slopes and upland forests support honey mesquite (*Prosopis glandulosa*) and several cedars and junipers (*Juniperus spp.*), and have become more prevalent due to the absence of regular fires. The acreage for types of vegetation classes at Joe Pool Lake are described in Table 2.6.

Table 2.6 Average, Maximum, and Minimum Total WHAP Scores per Habitat Type

Habitat Type ¹	Average Total Score	Maximum Total Score	Minimum Total Score
Deciduous Forest	55	75	38
Mixed Forest	56	82	40
Riparian Forest	60	85	40
Grassland	61	79	38

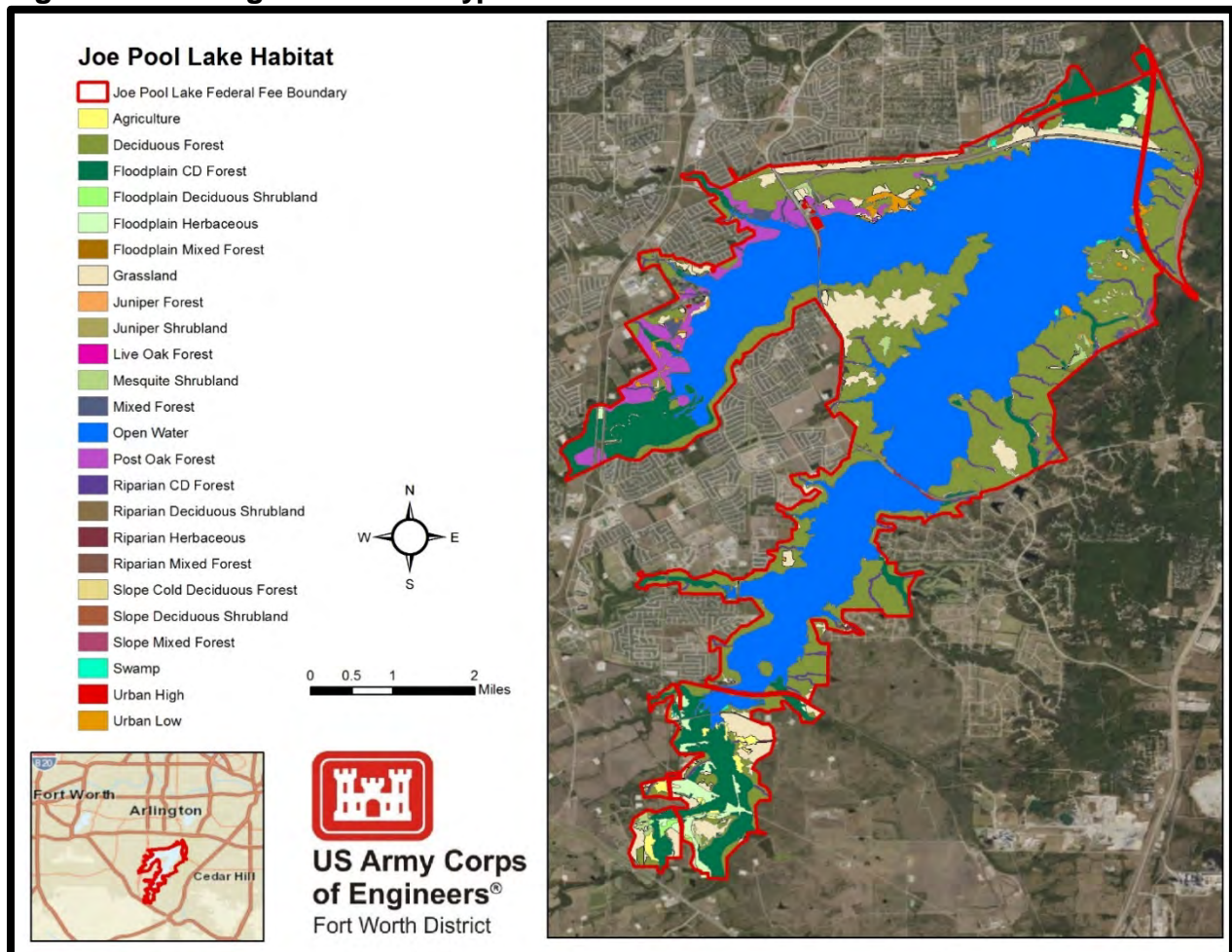
¹ Deciduous Forest is primarily upland forest dominated by a mix of juniper, elms, sugar hackberry and mesquite. Mixed Forest is typically a savannah mix of grass and young hardwoods on old agricultural fields. Riparian Forest typically has a bottomland hardwood component of bur oak, cedar elm, pecan, American elm, eastern cottonwood and a few black walnuts. The Grassland at Joe Pool Lake varies from high quality native prairie to old agricultural fields dominated by introduced species.

2.2.3 Wetlands

Typically, the National Wetlands Inventory (NWI) established by US Fish and Wildlife Service (USFWS) is used to identify wetland types in a project area. However, the available dataset for the Joe Pool project area was mapped prior to impoundment and does not reflect the current conditions. Therefore, NWI was not used to identify and calculate wetland acreage with the fee boundary of the project. Instead, the Ecological Mapping System (EMS) developed by Texas Parks and Wildlife (TPWD) was used. Using the TPWD's EMS mapping, wetlands are delineated as swamps and the lake is shown as open water. At Joe Pool Lake 18.65 acres are mapped as swamp wetlands and 6,582.93 acres are shown as open water. Figure 2.8 displays the ecological habitat types at Joe Pool Lake based on EMS including wetland habitat types.

Some of the wetlands described in the EMS qualify as Waters of the United States as defined within the Clean Water Act (CWA), and jurisdiction is addressed by the USACE and United States Environmental Protection Agency (EPA). Wetlands are a subset of the waters of the United States that may be subject to regulation under Section 404 of the CWA (40 CFR 230.3).

Figure 2.8 Ecological Habitat Types at Joe Pool Lake



Source: TPWD Ecological Mapping Service

2.2.4 Fish and Wildlife Resources

Joe Pool Lake provides habitat for an abundance of fish species, providing fishing opportunities from the shoreline, boats, and fishing platforms at the marina. Predominant fish species in the lake are largemouth bass (*Micropterus salmoides*), channel catfish (*Ictalurus punctatus*), white crappie (*Pomoxis annularis*), and white bass (*Morone chrysops*). Other less prominent species include black, yellow, and striped bass; carp; blue and hybrid catfish; gar; and sunfish. Several species have been stocked periodically since 1981 with bass and catfish being the most popular. There is significant fishing pressure at the lake, since it is located within one of the most populated urban metro areas in the United States. TPWD has set special size restrictions for largemouth bass at Joe Pool Lake.

Many of the undeveloped open spaces provide habitat for wildlife including coyotes (*Canis latrans*), bobcats (*Lynx rufus*), eastern cottontail rabbit (*Sylvilagus floridanus*), fox squirrel (*Sciurus niger*), nine-banded armadillo (*Dasypus novemcinctus*), striped skunks (*Mephitis mephitis*), and raccoons (*Procyon lotor*). The area also provides habitat for a diverse range of birds and acts as a stopover for

migratory birds. The entire USACE land holding at Joe Pool is located within the corporate city limits of Dallas, Grand Prairie, Cedar Hill, and Mansfield. Due to the proximity to urban development, hunting is prohibited at Joe Pool Lake.

2.2.5 Threatened and Endangered Species

Threatened species are those which are likely to become endangered within the foreseeable future. Endangered species are in danger of extinction throughout all or a significant portion of their range. Section 7(a)(2) of the Endangered Species Act requires federal agencies to ensure that any action authorized, funded, or carried out by such agency is not likely to: (1) jeopardize the continued existence of any endangered or threatened species or (2) result in the destruction or adverse modification of critical habitat. The term, "jeopardize the continued existence of", means to reduce appreciably the likelihood of both the survival and recovery of listed species in the wild by reducing the species' reproduction, numbers, or distribution. Jeopardy opinions must present reasonable evidence that the project will jeopardize the continued existence of the listed species or result in destruction or adverse modification of critical habitat. Federally-listed threatened and endangered species having potential to occur on USACE lands and waters at Joe Pool Lake are listed in Table 2.7.

Table 2.7 USFWS List of Threatened and Endangered Species That May Occur Within Joe Pool Lake Federal Fee Boundary

Species Name (common name)	Species Name (scientific name)	Federal Status	Habitat Type	Occurrence
Least Tern	<i>Sterna antillarum</i>	Endangered	Open waters, rivers, shorelines, and sandbars.	Potential
Piping Plover	<i>Charadrius melodus</i>	Threatened	Open waters, rivers, lakes, estuaries, marshes, swamps, shorelines, and sandbars.	Potential
Whooping Crane	<i>Grus americana</i>	Endangered	Marshes, shallow lakes, lagoons, salt flats, grain and stubble fields, and barrier islands.	Potential
Golden-cheeked Warbler	<i>Dendroica chrysoparia</i>	Endangered	Old-growth and mature regrowth Ashe juniper-oak woodlands in rocky terrain.	Rare

In addition to those federally endangered species, there are also many threatened and vulnerable species, most of which are migratory birds which could

include stopovers and breeding at Joe Pool Lake. The species and their potential presence are documented in detail in the Information for Planning and Consultation (IPaC) report by the US Fish & Wildlife Service (USFWS). TPWD also lists threatened and endangered species within the state as shown in Table 2.8. Additionally, TPWD also lists Species of Greatest Conservation Need (SGCN) for the Texas Blackland Prairie Ecoregion. The SGCN list is provided in Appendix C.

Table 2.8 TPWD List of Threatened and Endangered Species That May Occur Within the Joe Pool Lake Federal Fee Boundary

Common Name	Scientific Name	Type	Listing Status
Alligator snapping turtle	<i>Macrochelys temminckii</i>	Reptile	Threatened
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	Bird	Threatened
Bald eagle	<i>Haliaeetus leucocephalus</i>	Bird	Threatened
Black-capped Vireo	<i>Vireo atricapilla</i>	Bird	Endangered
Golden-cheeked Warbler	<i>Setophaga chrysoparia</i>	Bird	Endangered
Gray wolf	<i>Canis lupus</i>	Mammal	Endangered
Interior Least Tern	<i>Sterna antillarum athalassos</i>	Bird	Endangered
Louisiana pigtoe	<i>Pleurobema riddellii</i>	Mollusk	Threatened
Peregrine Falcon	<i>Falco peregrinus</i>	Bird	Threatened
Piping Plover	<i>Charadrius melodus</i>	Bird	Threatened
Red wolf	<i>Canis rufus</i>	Mammal	Endangered
Sandbank pocketbook	<i>Lampsilis satura</i>	Mollusk	Threatened
Shovelnose sturgeon	<i>Scaphirhynchus platyrhynchus</i>	Fish	Threatened
Texas heelsplitter	<i>Potamilus amphichaenus</i>	Mollusk	Threatened
Texas horned lizard	<i>Phrynosoma cornutum</i>	Reptile	Threatened
Texas pigtoe	<i>Fusconaia askewi</i>	Mollusk	Threatened
Timber rattlesnake	<i>Crotalus horridus</i>	Reptile	Threatened
White-faced Ibis	<i>Plegadis chihi</i>	Bird	Threatened
Whooping Crane	<i>Grus americana</i>	Bird	Endangered
Wood Stork	<i>Mycteria americana</i>	Bird	Threatened

2.2.6 Invasive Species

An invasive species is defined as a plant or animal that is non-native (or native nuisance) to an ecosystem and whose introduction causes, or is likely to cause, economic and/or environmental harm, or harm to human health. Invasive species can thrive in areas beyond their normal range of dispersal. These species are characteristically adaptable, aggressive, and have high reproductive capacity. Their vigor, along with a lack of natural enemies or controls, often leads to outbreak populations with some level of negative effects on native plants, animals, and

ecosystem functions. They are often associated with disturbed ecosystems and human developments.

Because several metropolitan areas are located in the Texas Blackland Prairie ecoregion, it has led to a greater number of invasive species than most other regions of the state. Feral and free-ranging pets (cats and dogs in particular) have made a significant impact on populations of small mammals, reptiles, and birds. Across the entire ecosystem, feral hogs (*Sus scrofa*) have decimated several fragile habitats and can change topography and worsen erosion in areas with large hog populations.

Other invasive animals include red imported fire ants (RIFA, *Solenopsis invicta*), several species of introduced fish (including released baitfish and species associated with “aquarium dumping”), house sparrows (*Passer domesticus*), common starlings (*Sturnus vulgaris*), and mollusks including zebra mussels (*Dreissena polymorpha*). Although native, cowbirds (*Molothrus ater*) have become problematic due to their expanding range associated with agriculture and human development. The close proximity to urban landscaping has led to many common landscape plants becoming aggressive colonizers and become invasive at Joe Pool Lake. Table 2.9 lists the invasive species known to be found at Joe Pool Lake. Other species are currently being researched for their invasive characteristics, while there may be debate on whether other species should be considered invasive.

Table 2.9 Invasive Species

Common Name	Scientific Name	Status	Type
Argentine Ant	<i>Linepithema humilis</i>	Non-native	Insect
Bahiagrass	<i>Paspalum notatum</i>	Non-native	Plant
Bermuda Grass	<i>Cynodon dactylon</i>	Non-native	Plant
Brown-headed Cowbirds	<i>Molothrus ater</i>	Native aggressive	Animal
Chinaberry	<i>Melia azedarach</i>	Non-native	Plant
Chinese Tallow	<i>Tridica sebifera</i>	Non-native	Plant
Common Starling	<i>Sturnus vulgaris</i>	Non-native	Animal
Feral Cats	<i>Felis silvestris</i>	Non-native	Animal
Feral Hogs	<i>Sus scrofa</i>	Non-native	Animal
Giant Reed	<i>Arundo donax</i>	Non-native	Plant
Giant Salvinia	<i>Salvinia molesta</i>	Non-native	Plant
Heavenly bamboo	<i>Nandina domestica</i>	Non-native	Plant
House Sparrow	<i>Passer domesticus</i>	Non-native	Animal
Hydrilla	<i>Hydrilla verticillata</i>	Non-native	Plant
Johnsongrass	<i>Sorghum halepense</i>	Non-native	Plant
Juniper & Cypress	<i>Juniperus spp.</i>	Native aggressive	Plant
King Ranch Bluestem (KR)	<i>Bothriochloa ischaemum</i> var. <i>songarica</i>	Non-native	Plant

Common Name	Scientific Name	Status	Type
Mediterranean Mustard	<i>Hirschfeldia incana</i>	Non-native	Plant
Honey Mesquite	<i>Prosopis glandulosa</i>	Native aggressive	Plant
Parrot's Feather	<i>Myriophyllum aquaticum</i>	Non-native	Plant
Pincushions	<i>Scabiosa atropurpurea</i>	Non-native	Plant
Privet	<i>Ligustrum spp. (several)</i>	Non-native	Plant
Red Imported Fire Ants (RIFA)	<i>Solenopsis invicta</i>	Non-native	Animal
Tree of Heaven	<i>Ailanthus altissima</i>	Non-native	Plant
Water hyacinth	<i>Eichhornia crassipes</i>	Non-native	Plant
Whitebrush	<i>Aloysia grati</i>	Native aggressive	Plant
Yellow Sour Clover	<i>Melilotus indicus</i>	Non-native	Plant
Zebra Mussel	<i>Dreissena polymorpha</i>	Non-native	Animal

Source: Texas Conservation Action Plan: Texas Blackland Prairies Ecoregion Handbook August 2012

2.2.7 Interpretation and Visual Qualities (Visual and Scenic Resources)

Joe Pool Lake includes many acres of scenic shorelines, lake views, and wildlife viewing areas providing high visual and scenic qualities. Some areas are admired for their scenic attractiveness (intrinsic scenic beauty that evokes a positive response), scenic integrity (wholeness of landscape character), and landscape visibility (how many people view the landscape and for what reasons and how long). Because Joe Pool Lake is located near several large cities, people come from local urban communities to enjoy the scenic and naturalistic views offered at the lake. Some areas have been designated as Wildlife and Vegetative Management or Environmentally Sensitive Areas to preserve specific animal, plant, or environmental features which also add to the scenic qualities at the lake. Nearby parks have been designed to access the lake, allow access to hiking trails, and take advantage of scenic qualities at the lake and surrounding areas.

Joe Pool Lake is located in the Cedar Hill area, which is a unique convergence of local geography and habitats. The rolling tallgrass prairie and its black, clay soil clash with the rugged limestone escarpment. The park is reminiscent of the Texas Hill Country, providing many naturalistic views and giving visitors an escape from the surrounding urban communities. The linear nature of the lake gives unique views of the limestone shorelines with both near and distant views of forests, prairies, and parks.

Adjacent landowners are informed that removing trees to obtain a view of the lake not only destroys wildlife habitat but also lowers the scenic quality of the shoreline when viewed by the general public from the water surface. Additionally, reasonable measures must be taken to ensure that damage to the natural landscape from invasive species and catastrophic wildfire are minimized. Vegetative management, mowing

permits, debris removal, and other shoreline issues are addressed by the shoreline policy.

2.2.8 Mineral and Timber

Minerals

Oil and natural gas are the principal minerals known to exist in the region surrounding Joe Pool Lake. Since the late 1990's and continuing today, active drilling for natural gas in the Barnett Shale formation has comprised the majority of mineral exploration near the lake. Currently, there are no well surface locations on USACE property, but several well surface locations outside USACE property have multiple well bores that extend horizontally under USACE property, including under the water surface. This is typical for most wells in the region wherein natural gas is retrieved through a process of horizontal drilling and hydraulic fracturing. Most of the surface well sites are located to the west of the lake. There are also several gas pipelines in the region, three of which cross USACE property. See Figure 2.9 for a map of existing oil and natural gas activity at Joe Pool Lake.

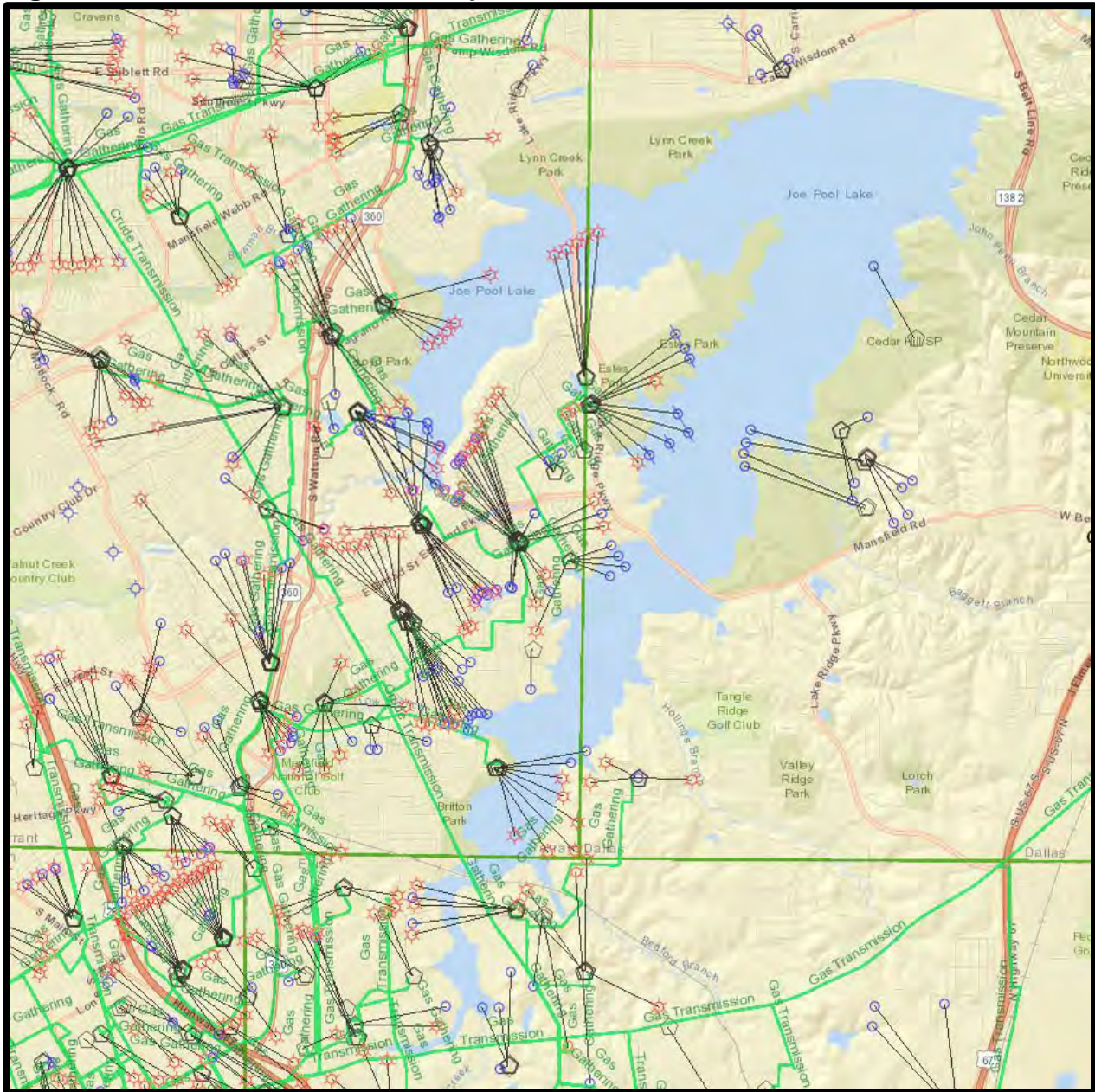
During acquisition of lands for Joe Pool Lake, only relatively small areas of the mineral estate were acquired. Those areas include the mineral estate immediately under and adjacent to the dam which were acquired to protect the structural integrity of the dam and associated prime facilities, as well as a few isolated tracts upstream from the dam. The majority of the mineral estate underlying the lake remains in private ownership. However, virtually all of the private minerals underlying the lake were subordinated by USACE to the extent that occupation of federally-owned surface for the purpose of mineral extraction is not allowed. As of the date of this Master Plan, no waivers of this subordination have been granted. In addition to this strong subordination of the mineral estate, USACE has implemented a "no hydraulic fracturing" zone around each dam operated and maintained by USACE. This zone is typically 3,000 horizontal feet from the toe of the dam, but in the case of Joe Pool Lake, the zone extends 4,000 horizontal feet. USACE also monitors proposed locations of waste water injection wells where contaminated water from drilling and hydraulic fracturing operations are injected deep within the earth.

On several USACE tracts remote from the dam where the mineral estate was acquired by USACE, the minerals were leased to a private operator. As with all federally-owned minerals, the lease was issued by the Department of Interior, Bureau of Land Management, and contains protective stipulations required by USACE, including the stipulation that no surface occupancy is allowed. The single lease in question is set to expire in 2020.

Timber

Joe Pool Lake is not located in a region having viable commercial timber resources. The woodlands that exist on USACE lands have value primarily as wildlife habitat and as an aesthetic resource, but have no commercial timber value.

Figure 2.9 Natural Gas Wells and Pipelines Around Joe Pool Lake



Source: Texas Railroad Commission Public GIS Viewer

2.2.9 Water Usage and Quality

Municipal water from Joe Pool Lake is managed by the TRA who uses the lake for water storage. TRA has committed all of the water supply to Cedar Hill, Duncanville, Grand Prairie, and the Midlothian Water District. TRA diverts 17,000 acre-feet annually for those cities, who are entitled to water in the following percentages, as water availability allows: Cedar Hill 43.21%, Midlothian 39.19%, Grand Prairie 10.56%, and

Duncanville 7.04%. Cedar Hill, Duncanville, and Grand Prairie contracted with TRA to construct a water intake structure and pump station at Joe Pool Lake as part of the Lakeview Regional Water Supply Project. The initial infrastructure was completed before impounding water in the lake, since it would have been cost prohibitive after impoundment, but has never been placed in service. The project will be further developed when additional demand for drinking water makes it necessary. Currently, only the city of Midlothian has an active water intake on USACE land in the southern end of Cedar Hill State Park [Source TRA].

According to the 2014 Texas Commission on Environmental Quality (TCEQ) Report, there were no water quality issues with the exception of “Screening Level of Concern” for Nitrate. All other monitored parameters were classified as either “Fully Supporting” their designated uses of public water supply and fish consumption, “No Concern,” or “Not assessed.” The EPA released a water body report and water quality assessment in 2014. Designated uses of the lake were assessed, and all of them were found to be “good.” Earlier USGS reports from 2007 assessed various biological and chemical parameters. The sampling results indicate that the levels of the various biological and chemical constituents monitored are generally within the criteria set by the Texas Department of Water Resources, and does not have any present or potential water quality problems.

2.2.10 Sedimentation and Shoreline Erosion [From WCM]

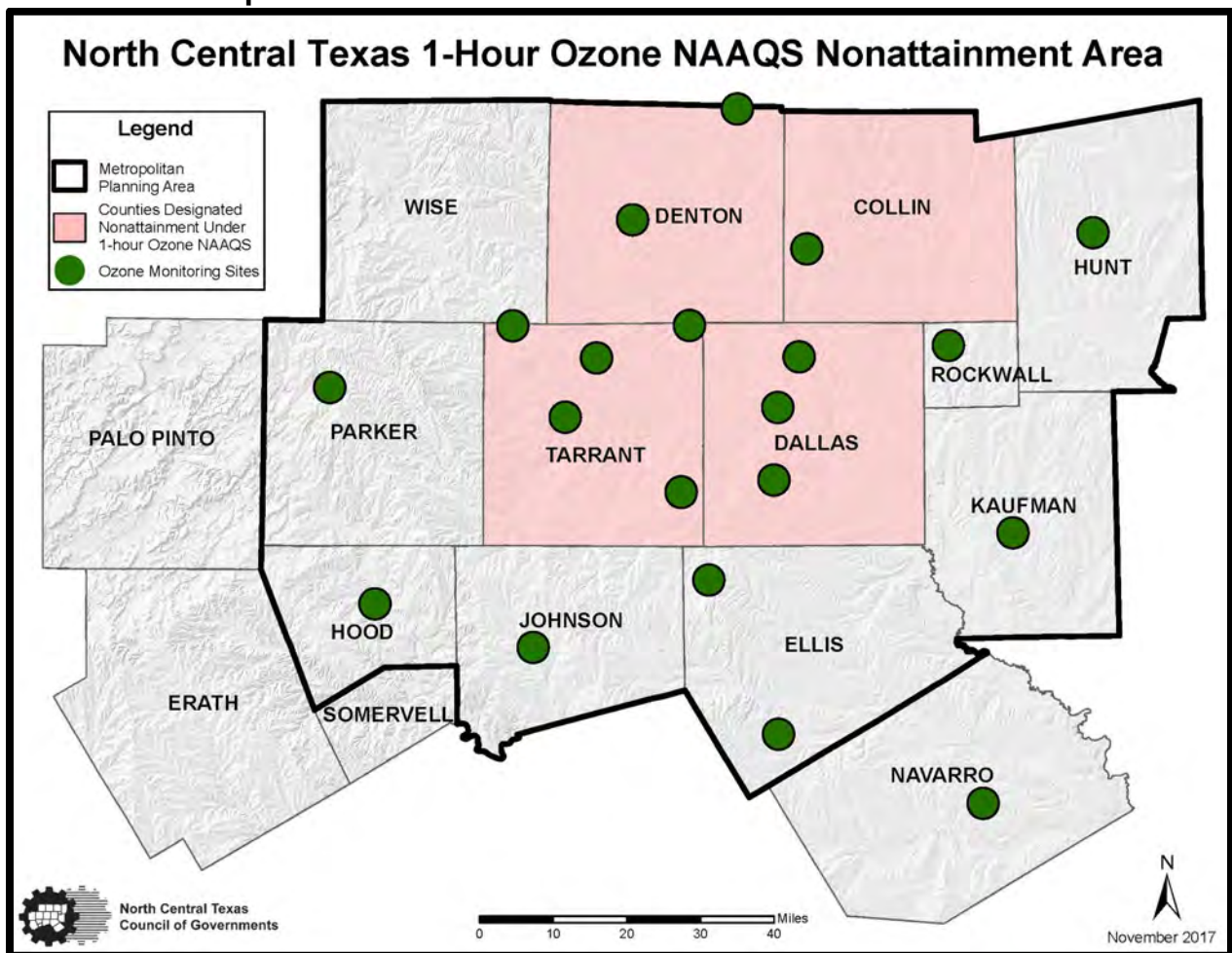
There are 25 sedimentation ranges in the Joe Pool Lake area. Sedimentation ranges are areas that have been designated to monitor the rate of sedimentation and the location of sediment deposits. The ranges cross the lake normal to the original stream flow as practical. The elevations and locations of the monuments are referenced to appropriate datum systems established by other Federal agencies. Monuments are used at multiple locations for future survey at common reference points. There are 4 degradation ranges downstream of Joe Pool Dam, each range consists of two or more permanent monuments, to be used in sediment surveys.

In 1982, the Joe Pool Lake watershed was largely rural, with over 95 percent of the watershed classified as cropland, pasture, range, or forest. However, since 1999 urbanization has been expanding rapidly around the lake area. On the basis of historical sedimentation in Mountain Creek Lake and predicted upstream development, Joe Pool Lake was designed to store 38,000 acre-feet of sediment in its 100-year lifetime. This 38,000 acre-feet is equivalent to an average sediment production of 1.64 acre-feet per square mile per year over the NGVD. It is estimated that 34,000 acre-feet of sediment will be deposited below elevation 522.0 NGVD and the remaining 4,000 acre-feet between elevations 522.0 and 536.0 NGVD. A schedule prepared in the Office of the Division Engineer, SWD indicates that resurveys were planned for about 5-year intervals. However, currently no sediment surveys have been completed since the construction of Joe Pool Dam and Lake.

2.2.11 Air Quality

In 2012, the US Environmental Protection Agency (EPA) designated the North Central Texas region as a nonattainment area for the pollutant ozone in accordance with the 1997 eight-hour ozone National Ambient Air Quality Standards (NAAQS). A nonattainment area is an area considered to have air quality worse than the NAAQS as defined in the Clean Air Act. These standards are designed to protect human and environmental health, and ground-level ozone is monitored and targeted for reductions due to its potentially harmful effects. The counties included in the North Central Texas nonattainment area are Wise, Denton, Collin, Hunt, Parker, Tarrant, Dallas, Rockwell, Kaufman, Hood, Johnson, and Ellis, as shown on the map in Figure 2.10.

Figure 2.10 North Central Texas Nonattainment Area/ Dallas-Fort Worth Metropolitan Area



In order to receive some forms of federal assistance, nonattainment areas must have a State Implementation Plan (SIP) to reduce ozone to levels compliant with the NAAQS and have EPA reviews every five years. Four main sources of ozone-causing emissions include on-road mobile sources like cars and trucks, non-road mobile sources like construction equipment, point sources like electricity-generating utilities and

industrial boilers, and area sources like solvent use and agriculture. The Dallas-Fort Worth area SIP includes programs to get older cars off the road, technologies to clean up vehicles already on the road, and education programs so that citizens can do their part in improving air quality in Northern Texas. For more information about what individuals and businesses can do to clean the air, visit the Air North Texas website.

There are no air monitoring stations on USACE property at Joe Pool Lake, but there are several nearby operated by the Texas Commission on Environmental Quality (TCEQ). Those stations monitor for Nitric Oxide (NO), Nitrogen Dioxide (NO₂), other Nitrogen Oxides (NO_x), Ozone (O₃), PM_{2.5}, as well as weather and climate data. TCEQ also collects air samples at several natural gas well sites around Joe Pool Lake and also across the entire region. Because Joe Pool Lake is located within an urban area, all monitored substances can reach moderate levels on occasion, normally when weather patterns cause the air to stagnate. TCEQ's Air Quality Index (AQI) is based on ozone and PM_{2.5} levels, and sometimes reaches "unhealthy for sensitive groups," which could affect people with asthma and those with prolonged or heavy outdoor exertion. The AQI occasionally reaches "unhealthy" levels, but rarely reaches "very unhealthy" or "hazardous" levels, and would likely be related to fires or unusual atmospheric events. The region is also prone to "very high" pollen counts for much of the year, affecting those with allergies and allergy-related asthma. The tree canopy and other vegetation around Joe Pool Lake help to mitigate local air pollution by absorbing carbon dioxide (CO₂), filtering airborne particulates and other airborne pollutants, and modulating local temperatures influencing the urban heat island effect.

In conducting routine operations and maintenance activities at Joe Pool Lake, the USACE will comply with all Federal, state, and local laws governing air quality and will implement Best Management Practices (BMPs) to protect air quality. Prescribed fire is a useful land management tool for improving native prairie and certain forested areas and will be conducted in accordance with the Texas Administrative Code, Section 111.211(1). Statutory requirements governing prescribed fire and other types of outdoor burning are explained in the TCEQ publication "Outdoor Burning in Texas" available on the TCEQ website. USACE guidance for wildland fire management is set forth in EP 1130-2-540.

2.3 CULTURAL RESOURCES

2.3.1 Prehistoric

The earliest well-documented evidence of human occupation in North Central Texas dates to about 12,000 years before present (B.P.). Prehistory is divided generally into three broad time periods: Paleo-Indian (12,000-8,500 B.P.), Archaic (8,500-1,250 B.P.), and Late Prehistoric (1,250-300 B.P.).

Evidence for Paleo-Indian period occupation is relatively rare in the Joe Pool Lake area, and is known primarily from distinctive projectile point styles dating to this time period found in surface collections or in mixed multi-component sites. It is likely that intact Paleo-Indian camp sites may be buried deeply beneath Holocene floodplain

alluvium, as was the case with the Aubrey Clovis site on the Elm Fork Trinity River. Evidence suggests that the region was occupied by small groups of highly mobile hunter-gatherers that traveled over very large territories. Traditionally thought of as big-game hunters of mammoth and bison, more recent evidence indicates Paleo-Indians exploited a much broader range of animal and plant resources.

The Archaic period is divided into Early (8,500-6,000 B.P.), Middle (6,000-3,500 B.P.), and Late (3,500-1,250 B.P.) sub periods. During this long time period, a generalized hunting and gathering subsistence strategy is indicated. Trends through time suggest increasing population density and decreasing group mobility within smaller territories. Sites with Late Archaic components are well represented in the Joe Pool Lake area and in North Central Texas generally.

The Late Prehistoric Period (1,250-300 B.P.) is marked by the presence of the bow and arrow and pottery. During the early portion of this time span, subsistence strategies remained similar to those of the preceding Late Archaic. By around 800 B.P., there is evidence for maize horticulture and house structures indicating a more sedentary occupation at the Cobb-Pool Site (41DL148) at Joe Pool Lake. Pottery from Cobb-Pool includes plain and decorated grog-tempered specimens in the Caddo ceramic tradition. It is unclear whether this pottery was made locally or represents trade with East Texas Caddo groups. Plain, shell-tempered pottery is also found at Joe Pool Lake sites and is thought to show connections with southern plains groups to the north and west. This shell-tempered pottery is generally thought to date to the late portion of the Late Prehistoric period (after ca. 600 B.P.) when bison hunting became more important.

2.3.2 Historic

Local tradition holds that Native Americans of the Caddo Nation inhabited the Joe Pool Lake area prior to the arrival of the first white settlers in the early 1840s. The majority of these early settlers were farmers operating small family farms growing mainly wheat and corn. Dallas County was created out of Navarro County in 1845, and Tarrant and Ellis Counties followed in 1849. The population grew steadily between the 1840s and 1870s. After the Civil War, cotton farming became an important agricultural activity in the region and tenant farming was a major social institution. The arrival of the railroads in the early 1870s allowed farmers access to markets and led to a major increase in the number of farms. Many of the historic resources at Joe Pool Lake are the archeological remains of house sites and farmsteads dating from the late 19th century through the mid-20th century. The Anderson Farm home, once located on land that is now Cedar Hill State Park, is shown in Photo 2.1.

2.3.3 Previous Investigations at Joe Pool Lake

The initial archeological investigation at Joe Pool Lake was a survey conducted by Southern Methodist University (SMU) in 1977 and 1978. During that survey, 40 archeological sites were recorded (15 prehistoric, 23 historic, and two with both prehistoric and historic components). In 1979 and 1980, SMU conducted test

excavations at 16 prehistoric sites. Also in 1979 and 1980, 23 historic period sites were investigated by crews from North Texas State University.

In 1985 and 1986, SMU conducted data recovery investigations at five prehistoric sites and 13 historic sites. During this same period, SMU located and recorded 12 historic home sites based on locations shown on historic maps. Limited survey work since then has added to the number of known archeological sites.

2.3.4 Recorded Cultural Resources

Currently, 60 archeological sites have been recorded at Joe Pool Lake. Seven of these sites have been determined eligible for the National Register of Historic Places (NRHP), and 44 sites have been determined ineligible. The remaining nine sites have not yet been evaluated for NRHP eligibility. The surveys of the 1970s were not systematic and may not be considered adequate by current standards.

2.3.5 Long-term Objectives for Cultural Resources

As funding allows, a Cultural Resources Management Plan (CRMP) shall be developed and incorporated into the Operational Management Plan in accordance with EP 1130-2-540. The purpose of the CRMP is to provide a comprehensive program to direct the historic preservation activities and objectives at Joe Pool Lake. Completion of a full inventory of cultural resources at Joe Pool Lake is a long-term objective that is needed for compliance with Section 110 of the National Historic Preservation Act (NHPA). All currently known sites with unknown eligibility and newly recorded sites must be evaluated to determine their eligibility for the NRHP. In accordance with Section 106 of the NHPA, any proposed ground-disturbing activities or projects, such as those described in this master plan or as may be proposed in the future by others for right-of-way easements, will require cultural resource surveys to locate and evaluate historic and prehistoric resources. Resources determined eligible for the NRHP must be protected from proposed project impacts, or the impacts must be mitigated. All future cultural resource investigations at Joe Pool Lake must be coordinated with the State Historic Preservation Officer and federally-recognized Tribes to insure compliance with the National Historic Preservation Act, the Archaeological Resources Protection Act, and the Native American Graves Protection and Repatriation Act

Photo 2.1 Old Anderson farm homestead once located on land that is now Cedar Hill State Park



Photo Courtesy of TPWD

2.4 DEMOGRAPHIC AND ECONOMIC ANALYSIS

2.4.1 Current Demographics and Economics Trends and Analysis

Located near the center of the Dallas-Fort Worth Metropolitan Statistical Area, Joe Pool Lake is a regional resource, with most visitors coming from nearby urban communities. Located primarily within the southwest portion of Dallas County and extending into Ellis and Tarrant Counties, the primary zone of interest for the socio-economic analysis of Joe Pool Lake is defined as those counties surrounding the lake, which are Dallas, Ellis, Johnson, and Tarrant Counties, all in Texas.

2.4.2 Population

The zone of interest's population makes up almost 18% of the total population of Texas. From 2016 to 2045, the population in the zone of interest is expected to increase from 4.8 million to 6.3 million, an annual growth rate of 1%. By comparison, the population of Texas is projected to increase at a rate of 1.2% per year during that same timeframe, and the national growth rate is expected to be 0.6% per year. All counties within the zone of interest are projected to have positive growth, with Ellis and Johnson

Counties growing the fastest at an annual rate of 1.8% and 1.4%, respectively. Within the zone of interest, 53% live in Dallas County, 41% in Tarrant County, and approximately 3% in both Ellis and Johnson Counties.

Table 2.10 Population Estimates and 2045 Projections, 2000 and 2016

Geographical Area	2000 Population Estimate	2016 Population Estimate	2045 Population Projection
Texas	20,851,820	26,956,435	38,499,538
Dallas County	2,218,899	2,513,054	3,198,694
Ellis County	111,360	160,225	267,465
Johnson County	126,811	157,544	239,104
Tarrant County	1,446,219	1,947,529	2,642,486
Zone of Interest Total	3,903,289	4,778,352	6,347,749

Source: U.S. Census Bureau, Population Division (2000 Estimate); U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates (2016 Estimate); Texas State Data Center, The University of Texas at San Antonio (2045 Projections)

The distribution of the population among gender, as shown in Table 2.11, is approximately 49.6% male and 50.4% female in the zone of interest, which is the same as the overall gender distribution in Texas.

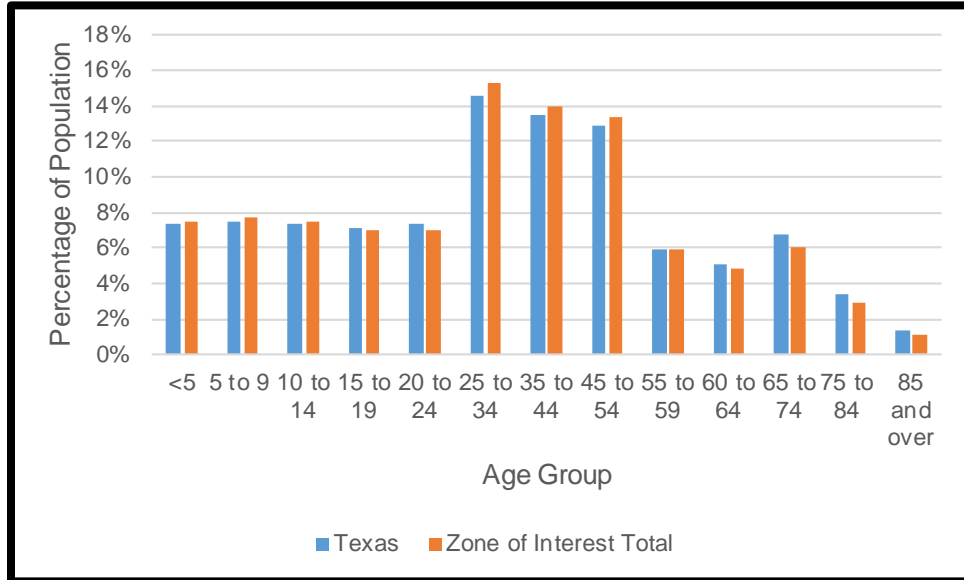
Table 2.11 Percent of Population Estimate by Gender, 2016

Geographical Area	Male	Female
Texas	13,379,165	13,577,270
Dallas County	1,238,199	1,274,855
Ellis County	79,024	81,201
Johnson County	78,506	79,038
Tarrant County	953,334	994,195
Zone of Interest Total	2,349,063	2,429,289

Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates (2016 Estimate)

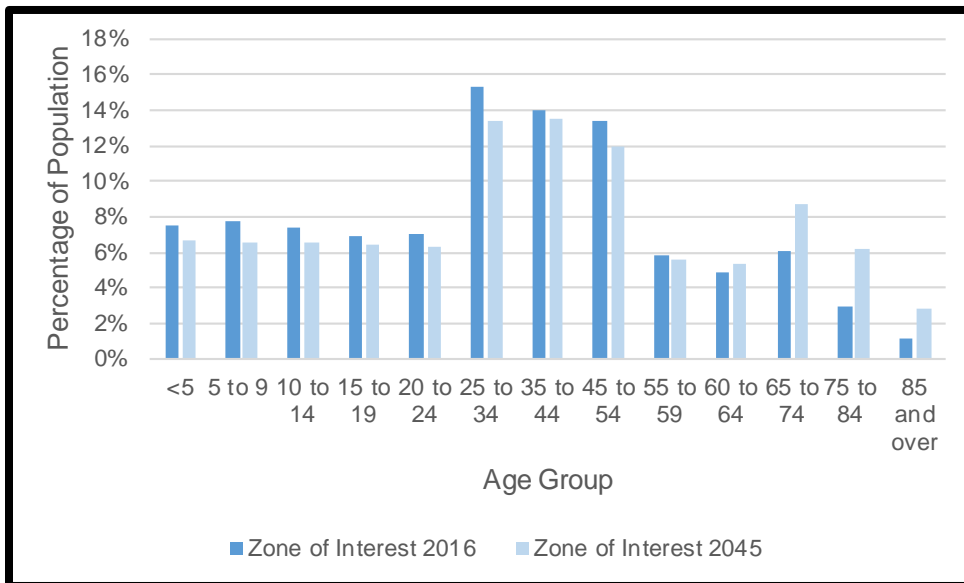
The distribution of age groups is very similar between the zone of interest and the state of Texas, with less than a percentage difference between the two in each age category. Figure 2.11 shows the population by age group of the zone of interest compared to Texas, and Figure 2.12 shows the zone of interest's population by age group in 2016 compared to the projections for 2045. The forecast shows that the population ages 0 to 59 will decrease while ages 60 and over will increase between 2016 and 2045.

Figure 2.11 Percent of Population by Age Group, 2016



Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates (2016 Estimate)

Figure 2.12 Population Estimate by Age Group for Years 2016 and 2045



Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates (2016 Estimate); Texas State Data Center, The University of Texas at San Antonio (2045 Projections)

Joe Pool Lakes’ zone of interest holds a racially and ethnically diverse population. The population in the zone of interest, displayed in Table 2.12, and further described in Figure 2.13, is approximately 41% White, 18% Black, 34% Hispanic or Latino, 5% Asian, and 2% two or more races. The other race categories account for less

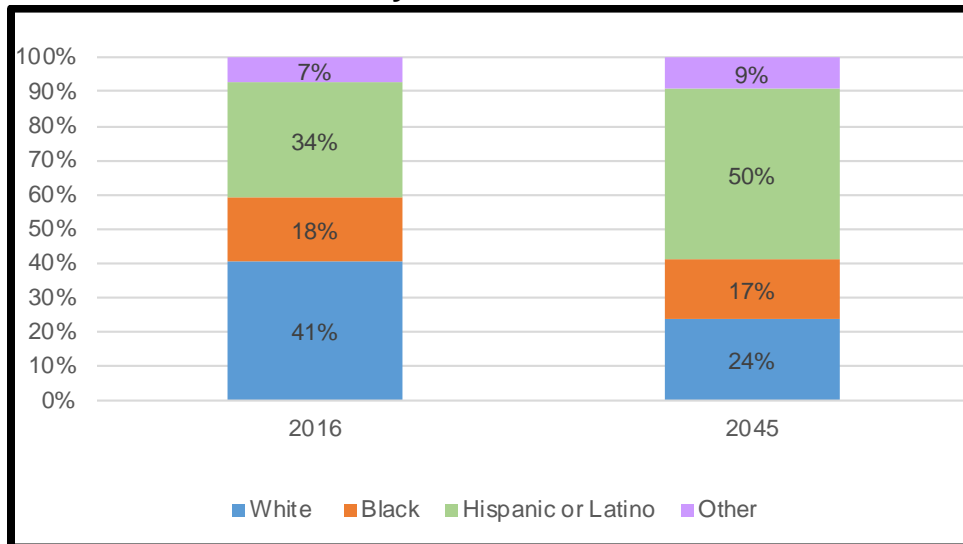
than 1% each of the population. By comparison, the state’s population is approximately 43% White, 12% Black, 39% Hispanic or Latino, 4% Asian, and 2% two or more races. Figure 2.13 shows the 2016 estimate and the 2045 projections of race/ethnicity in the zone of interest distributed between four categories, White, Black, Hispanic or Latino, and Other. The two graphs in Figure 2.13 show that the Hispanic or Latino and the other categories are expected to increase by 16% and 2% respectively in the zone of interest, while the White category decreases by 17% and the Black category decreases by 1%.

Table 2.12 2016 Population Estimate by Race/Hispanic Origin

Area	White	Black	American Indian and Alaska Native alone	Asian alone	Native Hawaiian and Other Pacific Islander alone	Some other race alone	Two or more races	Hispanic or Latino
Texas	11,705,684	3,134,962	63,336	1,161,742	18,990	35,509	423,062	10,413,150
Dallas County	774,653	554,464	4,234	144,440	1,163	3,916	42,335	987,849
Ellis County	101,530	14,506	354	1,050	59	98	2,494	40,134
Johnson County	117,123	3,919	693	1,152	623	89	2,810	31,135
Tarrant County	957,988	298,394	5,227	97,150	3,133	2,570	41,120	541,947
Zone of Interest Total	1,951,294	871,283	10,508	243,792	4,978	6,673	88,759	1,601,065

Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates (2016 Estimate)

Figure 2.13 Zone of Interest Population Estimate and Projection by Race/Ethnicity



Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates (2016 Estimate); Texas State Data Center, The University of Texas at San Antonio (2045 Projections)

2.4.3 Education

Table 2.13 displays the highest level of education attained by the population ages 25 and over. In the zone of interest, 9% of the population have less than a 9th grade education, and another 9% have between a 9th and 12th grade education; 24% have a high school diploma or equivalent, and another 22% have some college and no degree; 6% have an Associate's degree; 19% have a Bachelor's degree; and 10% have a graduate or professional degree. This distribution is similar to Texas, where 9% of the population have less than a 9th grade education; another 9% have between a 9th and 12th grade education; 25% have at least a high school diploma or equivalent; 22% have some college; 7% have an Associate's degree; 18% have a Bachelor's degree; and 10% have a graduate or professional degree.

Table 2.13 2016 Population Estimate by Highest Level of Educational Attainment, Population 25 Years of Age and Older

Area	Population 25 years and over	Less than 9th grade	9th to 12th grade, no diploma	High school graduate (includes equivalency)	Some college, no degree	Associate's degree	Bachelor's degree	Graduate or professional degree
Texas	17,085,128	1,519,768	1,496,184	4,286,126	3,821,713	1,160,660	3,158,468	1,642,209
Dallas County	1,590,088	182,829	166,605	358,305	320,726	89,634	301,964	170,025
Ellis County	101,769	7,038	8,639	29,032	26,974	7,751	15,912	6,423
Johnson County	102,285	6,479	10,074	33,763	26,063	7,756	13,109	5,041
Tarrant County	1,235,550	85,203	97,340	292,563	292,244	88,458	255,467	124,275
Zone of Interest Total	3,029,692	281,549	282,658	713,663	666,007	193,599	586,452	305,764

Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates (2016 Estimate)

2.4.4 Households, Income, Employment, Poverty

Table 2.14 displays the number of households and average household size in 2016. There were approximately 9.3 million households in the state of Texas with an average household size of 2.84 in 2016. The zone of interest contained approximately 1.7 million of those homes with an average household size of 2.66.

Table 2.14 2016 Households and Household Size

Geographic Area	Total Households	Average Household Size
Texas	9,289,554	2.84
Dallas County	894,542	2.77
Ellis County	53,803	2.94
Johnson County	53,880	2.87
Tarrant County	682,967	2.82
Zone of Interest Total	1,685,192	2.66
Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates (2016 Estimate)		

As shown in Table 2.15, the median household income in the zone of interest ranged from \$51,411 in Dallas County to \$64,382 in Ellis County in 2016, as displayed in Table 8. Per capita income in the zone of interest was \$28,922 in 2016, which was slightly higher than the state of Texas, which had a per capita income of \$27,828.

Table 2.15 2016 Median and Per Capita Income

Geographic Area	Median Household Income	Per Capita Income
Texas	\$54,727	\$27,828
Dallas County	\$51,411	\$28,552
Ellis County	\$64,382	\$27,313
Johnson County	\$59,095	\$25,721
Tarrant County	\$60,373	\$29,791
Zone of Interest Total	N/A	\$28,922
Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates (2016 Estimate)		

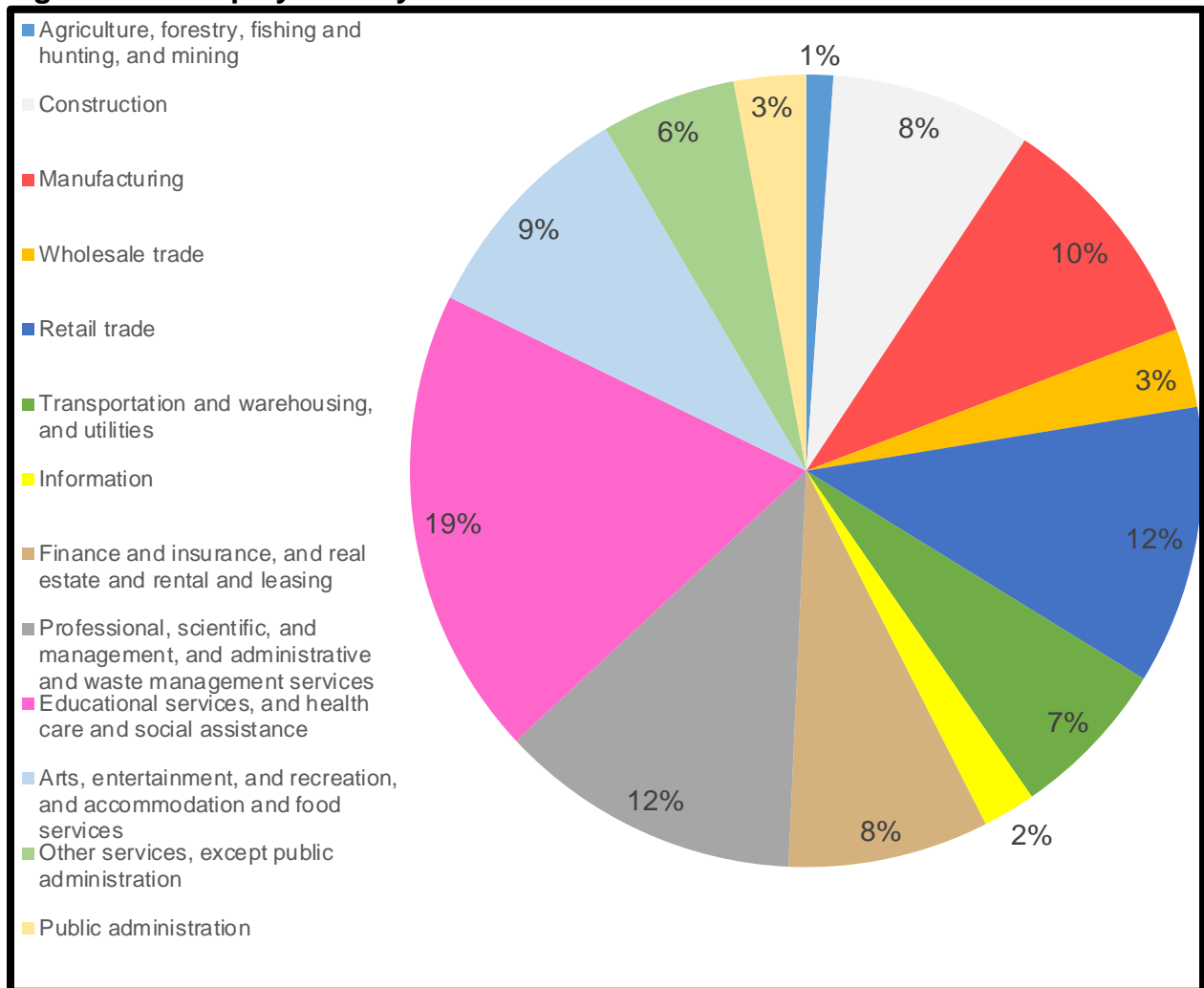
The civilian labor force in the zone of interest accounts approximately 19% of the civilian labor force of the state of Texas. As shown in Table 2.16, the zone of interest had an unemployment rate of 4.0% in 2016, lower than that of the state of Texas, which had an unemployment rate of 4.6% that same year. The unemployment rate in each of the counties in the zone of interest were lower than that of Texas, ranging from 3.8% in Ellis County to 4.3% in Johnson County.

Table 2.16 Labor Force, Employment and Unemployment Rates, 2016 Annual Averages

Facilities	Civilian Labor Force	Number Employed	Number Unemployed	Unemployment Rate
Texas	13,294,000	12,688,000	606,000	4.6%
Dallas County	1,305,202	1,253,334	51,868	4.0%
Ellis County	83,699	80,557	3,142	3.8%
Johnson County	75,584	72,299	3,285	4.3%
Tarrant County	1,008,020	968,246	39,774	3.9%
Zone of Interest Total	2,472,505	2,374,436	98,069	4.0%
Source: Bureau of Labor Statistics, Current Population Survey (State estimate), LAUS (County estimates)				

Employment by sector is presented in Figure 2.14, which shows that the largest percentage of individuals in the zone of interest are employed in the Educational services, and health care and social assistance sector at 19%, followed by 12% in the Professional, scientific, and management, and administrative and waste management services sector, 12% in Retail Trade, 10% in Manufacturing, 9% in the Arts, entertainment, and recreation, and accommodation and food services sector, 8% each in the Construction sector and the Finance and insurance, and real estate and rental and leasing sector, 7% in the Transportation and warehousing, and utilities sector, and 6% in Other services, except public administration. The remainder of the employment sectors each comprise less than 5% of the zone of interest's labor force.

Figure 2.14 Employment by Sector in Joe Pool Zone of Interest



Source: Bureau of Labor Statistics, Current Population Survey (State estimate), LAUS (County estimates)

The growth rate in each employment sector was predicted in the local Workforce Development Area (WDA) between 2014 and 2024. Ellis and Johnson Counties both fall in to the North Central WDA, while Dallas and Tarrant Counties each have their own WDA. Projected industry growth for each of the WDAs is expected to grow in each sector with the exception of agriculture, forestry, fishing and hunting, and mining, which is expected to see negative growth. When considering all three WDAs as a whole, the most growth is anticipated in the Construction sector, followed by the Educational services, and health care and social assistance sector, then the Professional scientific, and management, and administrative and waste management sector, and finally the Arts, entertainment, and recreation, and accommodation and food services sector.

Table 2.17 displays the percentage of persons and families whose incomes fell below the poverty level in the past twelve months as of 2016. In the zone of interest as a whole, a similar percentage of people (16.4%) had incomes below the poverty level when compared to the state, which had 16.7% of people below the poverty level. Dallas

County had the most persons with incomes below the poverty level at 18.6%, followed by Tarrant County at 14.4%, Johnson County at 12.1%, and Ellis County at 11%. In terms of families below the poverty level, the only county with a greater percentage of poverty than the state of Texas was Dallas County, which had 15.2% of families below the poverty level. The remainder of the counties in the zone of interest had between 8.5% and 10.9% of families below the poverty level in 2016.

Table 2.17 Percent of Families and People Whose Income in the Past 12 Months is Below the Poverty Level (2016)

Geographic Area	All Persons	All Families
Texas	16.7%	13.0%
Dallas County	18.6%	15.2%
Ellis County	11.0%	8.5%
Johnson County	12.1%	9.2%
Tarrant County	14.4%	10.9%
Zone of Interest Total	16.4%	N/A

Source: Bureau of Labor Statistics, Current Population Survey (State estimate), LAUS (County estimates)

2.4.5 Economic Impact

The Mountain Creek watershed is predominantly urban, with an economy based on trade, transportation, utilities, professional business service, education, and healthcare. The watershed is located within the Dallas-Fort Worth Metropolitan Statistical Area, with most of the economic activity occurring in the more populated Dallas and Tarrant Counties. Several sectors are typically heavy consumers of water including municipal, agriculture and livestock, steam-electric, mining, manufacturing, professional, scientific and technical services, health care and social assistance, accommodation and food services, and military installations.

The money spent by visitors to USACE lakes on trip expenses adds to the local and national economies by supporting jobs and generating income. In 2016, there were nearly 1.1 million visits (person-trips) to Joe Pool Lake. Visitor spending represents a sizable component of the economy in many communities around USACE lakes. Within 30 miles of the lake, visitors spent an additional \$27.1 million with \$19.7 million coming from retail sales. This spending led to an additional 250 jobs and \$7.8 million in labor income. Predicted population growth in the surrounding counties would likely lead to increased economic benefits to the surrounding communities for years to come.

2.4.6 Social, Economic, and Environmental Benefits

USACE recognized the importance of Joe Pool Lake and the activities on USACE lands and waters as being an important part of the local economy. Besides the obvious economic savings through flood risk management and development advantages through water supply, businesses can see investment opportunities, and people are drawn to the natural areas surrounding USACE lakes, as is evidenced by the growing number of residents adjacent to USACE properties. Nationally, USACE lakes

attract about 335 million recreation visits every year, with direct economic benefits on local economies within a 30 mile radius. The following information in Table 2.18 describes some of the extended social, environmental, and economic benefits of Belton Lake for surrounding communities in 2016. By providing opportunities for active recreation, Corps lakes help combat one of the most significant of the nation's health problems: lack of physical activity. Recreational programs and activities at Corps lakes also help strengthen family ties and friendships; provide opportunities for children to develop personal skills, social values, and self-esteem; and increase water safety.

Table 2.18 Social Benefits at Joe Pool Lake in FY 2016

Facilities in FY 2016	Visits (person-trips) in FY 2016
6 recreation areas	1,053,706 in total
315 picnic sites	247,279 picnickers
576 camping sites	51,879 campers
7 playgrounds	152,187 swimmers
4 swimming areas	119,680 water skiers
7 number of trails	125,339 boaters
36 trail miles	416,005 sightseers
7 boat ramps	643,605 fishermen
807 marina slips	106,227 others

Source: USACE

There have also been many economic benefits to the nation and economy at Joe Pool Lake. The money spent by visitors to Corps lakes on trip expenses adds to the local and national economies by supporting jobs and generating income. Visitor spending represents a sizable component of the economy in many communities around Corps lakes as summarized in Table 2.19.

Table 2.19 Social Benefits at Joe Pool Lake in FY 2016

Visitation per year resulted in:	With multiplier effects, visitor trip spending resulted in:
<ul style="list-style-type: none"> • \$27,117,358 in visitor spending within 30 miles of Joe Pool Lake. • \$19,777,062 in sales within 30 miles of Joe Pool Lake. • 250 jobs within 30 miles of Joe Pool Lake. • \$7,833,401 in labor income within 30 miles of Joe Pool Lake. • \$10,944,220 in value added within 30 miles of Joe Pool Lake. • \$7,724,719 in National Economic Development Benefits. 	<ul style="list-style-type: none"> • \$33,482,021 in total spending. • \$34,917,481 in total sales. • 337 jobs. • \$13,257,077 in labor income. • \$20,095,423 in value added (wages & salaries, payroll benefits, profits, rents, and indirect business taxes).

Source: USACE

Joe Pool Lake as also provided environmental benefits to the local community by providing access to local residents. Recreation experiences increase motivation to learn more about the environment; understanding and awareness of environmental issues; and sensitivity to the environment. The land acres, water acres, and shoreline miles are summarized in Table 2.20.

Table 2.20 Environmental Resource Summary in FY 2016

Resources in FY 2016
<ul style="list-style-type: none"> • 8,663 land acres above the conservation pool elevation of 522.0 NGVD • 6,707 surface water acres • 60 shoreline miles

2.5 RECREATION FACILITIES, ACTIVITIES, AND NEEDS

The initial development of outdoor recreation facilities at Joe Pool Lake was addressed in the 1981 Master Plan for Lakeview Lake (now Joe Pool Lake), Design Memorandum (DM) No. 11. Supplement No. 1 to the Master Plan was added in March 1985 providing plans for Lakeview State Park (now Cedar Hill State Park). These two documents laid out a robust plan for the comprehensive management of the lake's lands and water surface including plans for a significant investment in outdoor recreation facilities that were cost-shared between USACE, TPWD, and the TRA. A lease between USACE and TRA was executed in 1988 authorizing TRA to manage 1,879 acres for park and recreation purposes. This lease was supplemented over the years bringing the total acreage of land included in the lease to 2,925 acres. Legislation was passed in 2000 allowing the Secretary of the Army to transfer TRA's non-federal sponsorship of the recreation program at Joe Pool Lake from TRA to the city of Grand Prairie, Texas. Shortly following the passage of the legislation, the lease with TRA was supplemented to name the City of Grand Prairie the new lessee. One public marina operates on the lake under a sublease agreement with the City of Grand Prairie.

In 1982, 1,885 acres was leased to TPWD for development of what is now Cedar Hill State Park. The state park opened for public use in 1991. In January 2014, an additional 58 acres was added to the state park lease to extend the park boundary to the north encompassing the hike/bike trailhead used by pedestrians and bicyclists for access to the road across the top of Joe Pool Dam.

USACE has a limited role in directly managing outdoor recreation at the lake. This role consists of managing pedestrian use of the service road across the top of the dam, fishing use adjacent to the stilling basin area and along Mountain Creek below the dam, cooperative management of the water surface as it relates to boating activity, and managing general pedestrian access to lands that are not leased to Grand Prairie or TPWD. Many USACE lakes provide public hunting opportunities, but due to the very urban nature of Joe Pool Lake, public hunting has never been allowed. There are no plans to lift the prohibition on public hunting.

The following factors contribute to the importance of Joe Pool Lake as a recreational area:

- Centrally located in the Dallas-Fort Worth metropolitan area. By road, the Joe Pool Lake Dam is located 19 miles from downtown Dallas and 28 miles from downtown Fort Worth
- Large, full service state park operated by TPWD
- Full service campgrounds, day-use areas, and group lodging facilities operated by Grand Prairie
- Full service marina and easily accessible boat ramps

2.5.1 Zone of Influence

The zone of influence for Joe Pool Lake as it relates to this Master Plan includes Dallas, Tarrant, Ellis, and Johnson Counties.

2.5.2 Visitation Profile

The majority of visitors to Joe Pool Lake come from within the zone of influence. An examination of approximately 34,000 zip codes collected by the City of Grand Prairie in their Loyd Park campground during the time frame of 2013 through 2017 revealed that only about 8.2% of zip codes were from out-of-state and most of the remaining 92% traveled a relatively short distance varying from approximately 1 to 30 miles. Table 2.21 provides examples of the percentage of campers coming from several cities that either adjoin Federal property or are very nearby. Many campers come from numerous zip codes within the cities of Dallas and Fort Worth, but no attempt was made to list those.

Table 2.21 Point of Origin for Campers in Loyd Park

ZIP CODE	PERCENT OF CAMPERS
76010 thru 76019 (Arlington, TX) 76001 thru 76007 (Arlington, TX)	17.5%
75050 thru 75054 (Grand Prairie TX)	11.3%
76063 (Mansfield, TX)	6.7%
76028 (Burleson, TX)	2.5%
75060 thru 75063 (Irving, TX)	2.3%
75104 (Cedar Hill, TX)	1.3%

Source: Grand Prairie

USACE tracks visitation at Joe Pool Lake by tabulating information provided by TPWD and Grand Prairie as well as maintaining a traffic counter at the Overlook where TPWD and USACE have shared recreational management responsibilities. Refer to Table 2.22 for the total number of visits recorded for each area for 2016 which was a year without extreme lake conditions of drought or flooding.

Table 2.22 Joe Pool Lake Visitation - 2016

Area	Visits
Britton Park	8,099
Cedar Hill State Park	185,034
Dispersed Use - Total	455,620
Loyd Park	163,358
Lynn Creek Park	208,945
Lynn Creek Marina	20,676
Overlook	11,974
Grand Total	1,053,706

2.5.3 Recreation Areas and Facilities

The primary outdoor recreation facilities at Joe Pool Lake are operated by TPWD in Cedar Hill State Park and by the City of Grand Prairie in Lynn Creek, Loyd, and Britton Parks. USACE provides recreational opportunities by managing pedestrian traffic on the road across the top of Joe Pool Dam and fishing access to the stilling basin area. Table 2.23 provides a brief summary of the primary recreation facilities operated by TPWD and the city of Grand Prairie.

Table 2.23 Facilities Provided by TPWD and City of Grand Prairie

Facilities	TPWD Cedar Hill State Park	Grand Prairie
Walk-in Campsites	30	None
Campsites: electric and water	200	213 – Loyd Park
Campsites: electric, water and sewer	150	None
Picnic Sites	Yes – Varies with lake level	100 – Lynn Creek Park
Lodge	None	One with 18 rooms
Cabins	None	9 – Loyd Park
Group shelters	1	2 - Lynn Creek; 2 - Loyd
Bike Trail	Yes – Mountain Bikes	Yes – Lynn Creek and Loyd
Hike Trail	Yes	Yes – Lynn Creek and Loyd
Paddle Trail	No	Yes – Loyd Park
Boat Ramp	2	Yes – Lynn Creek (2), Loyd (1), and Britton (1)
Swimming Beach	1	1 – Lynn Creek, 1- Loyd
Interpretive Site	Yes	No

2.5.4 Recreational Analysis - Trends

The 2012 Texas Outdoor Recreation Plan (TORP) published by TPWD is a comprehensive recreational demand study completed by Texas Parks and Wildlife. Some of the information in the TORP was extracted directly from the National Survey on Recreation and the Environment (NSRE) and reports generated by the USFWS. The TORP pointed out the top five needs within all park systems in the state as identified by professional recreation providers and by Texas citizens. Tables 2.24 through 2.27 and Figure 2.14 are a summary from the TORP and are provided to illustrate general trends in outdoor recreation.

As seen in Table 2.24, the top five recreational facilities needs in Texas focus on walking, hiking, biking, and wildlife observations. As population grow and urban environments expand, this trend is expected to continue. Having a regional resource like Joe Pool Lake can provide these amenities to the rapidly expanding populations of the Dallas-Fort Worth region.

Table 2.24 Top Five Recreation Facilities Needed by Texas Citizens – TORP 2012

Top 5 Facilities Needed Now In Local Parks by Texas Citizens	
Unpaved trails for walking and hiking	43.6%
Natural park area/open space	31.8%
Mountain bike trails	31.4%
Paved trails for walking, hiking, biking, skating	30.1%
Wildlife/nature observation sites	27.8%

Source: NSRE; TORP 2012

Interest in watercraft sports such as boating, canoeing and kayaking continue to hold strong interest in recreation. Table 2.25 illustrates that over 35% of the population surveyed participate in boating activities. Canoeing and Kayaking are seeing an increase in participation amongst those surveyed.

Table 2.25 Percent of Population Participating in Recreational Boating in the U.S.

Percent of Population Participating in Recreational Boating in the U.S.				
	1982-1983	1994-1995	1999-2001	2005-2009
Boating	28.0%	37.8%	36.3%	35.6%
Canoeing/Kayaking	8.0%	9.5%	11.5%	12.4%

Source: Cordell & Green, National Survey on Recreation and the Environment, Texas Reports 1994-95, 2000-01 and 2006-09, 2009; TORP – 2012

While participation in hunting and fishing show stable growth across those surveyed, there is a large jump in the population of people who are participating in the more passive activity of wildlife watching. As seen in Table 2.26, from 2001 to 2006 almost a million more people reported participating in this activity.

Table 2.26 Participation in Hunting, Fishing, and Wildlife Watching in Texas

Participation in Hunting, Fishing and Wildlife Watching in Texas (Residents and Non-Residents, 16 years and older)				
Texas	Fishing	Hunting	Wildlife Watching	Total Participants (Fishing + Hunting + Wildlife Watching)
1996 Survey	2.5 million	829 thousand	3.6 million	4.7 million
2001 Survey	2.4 million	1.2 million	3.2 million	4.9 million
2006 Survey	2.5 million	1.1 million	4.2 million	6.0 million

Source: 1996, 2001, 2006 National Survey of Fishing, Hunting and Wildlife-Associated Recreation for Texas, USFWS; TORP 2012

Figure 2.15 Participation Rates of Texas Residents (2006-2009) versus U.S. Residents (2005-2009) in the Top 10 Outdoor Recreation Activities



Source: NSRE; TORP 2012

As illustrated in Figure 2.13, Texas and the US are very similar, with more participation in walking and family gatherings, for which the facilities at Joe Pool Lake can and do accommodate. No specific survey has been conducted at Joe Pool Lake to determine the ethnic/racial makeup of visitors, but the TORP provides an indication of White/Non-Hispanic versus Hispanics who participate in the top 10 outdoor recreation activities in Texas. Table 2.27 illustrates a slightly larger population of Hispanic respondents participate in many outdoor recreation activities typically available at Joe Pool Lake, including walking for pleasure and family gatherings.

Table 2.27 Comparison of Participation Rates of White/Non-Hispanics, Versus Hispanics in the Top 10 Outdoor Recreation Activities in Texas 2006-2009

ACTIVITY	White/Non-Hispanics	Hispanics
Walking for Pleasure	81.1%	83.4%
Family Gatherings	66.6%	75.8%
Gardening or Landscaping	66.3%	76.3%
Attend Outdoor Sports Events Outdoors	57.3%	68.4%
View/Photograph Natural Scenery	63.3%	57.2%
Visit Outdoor Nature Centers	49.8%	58.4%
View/Photograph Wildflowers	59.3%	49.0%
Sightseeing	54.1%	49.6%
Driving for Pleasure	53.6%	49.4%
Picnicking	43.4%	47.7%

Source: NSRE; TORP 2012

In addition to the trends information provided by the 2012 TORP and NSRE, the City of Grand Prairie published a parks master plan in 2016 for their entire city parks system including what they refer to as the Lake Parks leased from USACE at Joe Pool Lake. The city gathered public input for their master plan by hosting 8 public meetings and conducting a survey. Approximately 280 individuals attended the public meetings and 741 surveys were completed by households and returned. The public input gathered by the city indicated that Lynn Creek Park is the most visited park within the city's park system with 33% of those responding indicating they had visited the park. Loyd Park was the fifth most visited park with approximately 14% of respondents having visited the park. The city's survey indicated a need for facilities that was very similar to the needs indicated by all Texans in Table 2.24. The city's survey indicated the following needs:

- 64% indicated a need for more walking and hiking trails
- 53% indicated a need for more natural areas and nature parks
- 51% indicated a need for more neighborhood parks
- 45% indicated a need for more paved bike trails
- 45% indicated a need for more picnic shelters and areas

2.6 REAL ESTATE

Land acquisition for Joe Pool Lake followed the 1971 joint policy that applies to both Department of Interior and USACE water resources projects. Land up to elevation 541.0 feet NGVD, 5 feet above the top of the flood control pool, was acquired in fee simple to allow for the operation of Joe Pool Lake. Where the taking line at this elevation was not at least 300 horizontal feet from the flood control pool, the line was reset to provide a minimum taking width of 300 feet.

According to official real estate records, the area acquired in fee simple title at Joe Pool Lake was 15,067 acres, which includes land for the operation and maintenance of the project and public use areas. In addition to the fee land acquisition, approximately 1,904 acres of flowage easement was acquired in the upper reaches of several tributaries up to elevation 541.0 NGVD. The flowage easement estate conveys to the Government the right to flood lands encumbered with a flowage easement and to prohibit placement of habitable structures on the easement and to require written consent for the placement of any fill or structures on the easement.

Urban expansion in the cities of Grand Prairie, Cedar Hill and Mansfield have almost completely surrounded Joe Pool Lake. The road and utility network serving the expansion has resulted in numerous real estate outgrants on USACE fee and flowage easement lands. A summary of existing outgrants is provided in Table 2.28 as follows:

Table 2.28 Listing of Outgrants at Joe Pool Lake

Leases:	5
Grand Prairie Radio Tower Lease	1
TRA water treatment plant site	1
TPWD park lease	1
Grand Prairie park lease	1
BLM oil and gas lease	1
Easements:	63
Sewer/water/storm drainage	33
Gas pipeline	7
Road	4
Electric	13
Trail	2
Utility cable	2
Railroad tracks	1
Bridge	1
Licenses	4
Office space	1
Temporary construction	2
Water structure	1
Other (consents/roe, etc.)	31
Sewer/water/storm drainage	11
Electric	2
Roadway	1
Unknown	2
Swimming pool	3
Gas pipeline	4
Archeological	1
Trail	1
Pond	2

Right of entry	1
Fence	1
Other	1
Bridge	1

Some lands were acquired subject to existing easements which are not recorded in the permanent real estate outgrant database.

2.7 PERTINENT PUBLIC LAWS

Numerous public laws apply directly or indirectly to the management of Federal land at Joe Pool Lake. Listed below are several key public laws that are most frequently referenced in planning and operational documents. Refer to Appendix D for a more comprehensive listing.

- Public Law 78-534, Flood Control Act of 1944. - Section 4 of the act as last amended in 1962 by Section 207 of Public Law 87-874 authorizes USACE to construct, maintain, and operate public parks and recreational facilities in reservoir areas and to grant leases and licenses for lands, including facilities, preferably to Federal, State or local governmental agencies.
- Public Law 85-624, Fish and Wildlife Coordination Act 1958. - This act as amended in 1965 sets down the general policy that fish and wildlife conservation shall receive equal consideration with other project purposes and be coordinated with other features of water resource development programs. Opportunities for improving fish and wildlife resources and adverse effects on these resources shall be examined along with other purposes which might be served by water resources development.
- Public Law 86-717, Forest Conservation. - This act provides for the protection of forest and other vegetative cover for reservoir areas under this jurisdiction of the Secretary of the Army and the Chief of Engineers.
- Public Law 89-72, Federal Water Project Recreation Act of 1965. - This act requires that not less than one-half the separable costs of developing recreational facilities and all operation and maintenance costs at Federal reservoir projects shall be borne by a non-Federal public body. A HQUSACE/OMB implementation policy made these provisions applicable to projects completed prior to 1965.
- Public Law 91-190, National Environmental Policy Act of 1969 (NEPA). – NEPA declared it a national policy to encourage productive and enjoyable harmony between man and his environment, and for other purposes. Specifically, it declared a “continuing policy of the Federal Government... to use all practicable means and measures...to foster and promote the general welfare, to create conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.” Section 102 authorized and directed that, to the fullest extent possible, the policies,

regulations and public law of the United States shall be interpreted and administered in accordance with the policies of the Act. It is Section 102 that requires consideration of environmental impacts associated with Federal actions. Section 101 of NEPA requires the federal government to use all practicable means to create and maintain conditions under which man and nature can exist in productive harmony.

Specifically, Section 101 of the National Environmental Policy Act declares:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
 - Assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
 - Attain the widest range of beneficial uses of the environment without degradation risk to health or safety or other undesirable and unintended consequences;
 - Preserve important historic, cultural, and natural aspects of our national heritage and maintain wherever possible an environment which supports diversity and variety of individual choice;
 - Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities: and
 - Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.
- PL 89-665, Historic Preservation Act of 1966. - This act provides for: (1) an expanded National Register of significant sites and objects; (2) matching grants to states undertaking historic and archeological resource inventories; and (3) a program of grants-in aid to the National Trust for Historic Preservation; and (4) the establishment of an Advisory Council on Historic Preservation. Section 106 requires that the President's Advisory Council on Historic Preservation have an opportunity to comment on any undertaking which adversely affects properties listed, nominated, or considered important enough to be included on the National Register of Historic Places.
 - PL 101-601, Native American Graves Protection and Repatriation Act (16 November 1990), requires Federal agencies to return Native American human remains and cultural items, including funerary objects and sacred objects, to their respective peoples.

CHAPTER 3 - RESOURCE GOALS AND OBJECTIVES

3.1 INTRODUCTION

This chapter sets forth goals and objectives necessary to achieve the USACE vision for the future of Joe Pool Lake. The terms “goal” and “objective” are often defined as synonymous, but in the context of this Master Plan goals express the overall desired end state of the Master Plan whereas resource objectives are specific task-oriented actions necessary to achieve the overall Master Plan goals.

3.2 RESOURCE GOALS

The following statements, paraphrased from EP 1130-2-550, Chapter 3, express the goals for the Joe Pool Lake Master Plan:

- GOAL A.** Provide the best management practices to respond to regional needs, resource capabilities and capacities, and expressed public interests consistent with authorized project purposes.
- GOAL B.** Protect and manage project natural and cultural resources through sustainable environmental stewardship programs.
- GOAL C.** Provide public outdoor recreation opportunities that support project purposes and public interests while sustaining project natural resources.
- GOAL D.** Recognize the unique qualities, characteristics, and potentials of the project.
- GOAL E.** Provide consistency and compatibility with national objectives and other State and regional goals and programs.

In addition to the above goals, USACE management activities are guided by USACE-wide Environmental Operating Principles as follows:

- Strive to achieve environmental sustainability. An environment maintained in a healthy, diverse, and sustainable condition is necessary to support life.
- Recognize the interdependence of life and the physical environment. Proactively consider environmental consequences of USACE programs and act accordingly in all appropriate circumstances.
- Seek balance and synergy among human development activities and natural systems by designing economic and environmental solutions that support and reinforce one another.

- Continue to accept corporate responsibility and accountability under the law for activities and decisions under our control that impact human health and welfare and the continued viability of natural systems.
- Seek ways and means to assess and mitigate cumulative impacts to the environment; bring systems approaches to the full life cycle of our processes and work.
- Build and share an integrated scientific, economic, and social knowledge base that supports a greater understanding of the environment and impacts of our work.
- Respect the views of individuals and groups interested in USACE activities; listen to them actively, and learn from their perspective in the search to find innovative win-win solutions to the nation's problems that also protect and enhance the environment.

3.3 RESOURCE OBJECTIVES

Resource objectives are clearly written statements that respond to identified issues and that specify measurable and attainable activities for resource development and/or management of the lands and waters under the jurisdiction of the Fort Worth District, Joe Pool Lake Project Office. The objectives stated in this Master Plan support the goals of the Master Plan, USACE Environmental Operating Principles (EOPs), and applicable national performance measures. They are consistent with authorized project purposes, Federal laws and directives, regional needs, resource capabilities, and they consider public input. Recreational and natural resources carrying capacities are also accounted for during development of the objectives found in this Master Plan. Regional and State planning documents including TPWD's Texas Conservation Action Plan (TCAP) and TORP are monitored for applicability to Joe Pool Lake. Finally, these objectives are consistent with the management objectives of Texas Parks and Wildlife Department at Cedar Hill State Park, and with the management objectives of the City of Grand Prairie at the seven distinct parcels of USACE land they manage under lease agreements with USACE.

The objectives in this master plan provide project benefits, meet public needs, and foster environmental sustainability for Joe Pool Lake to the greatest extent possible. They include recreational objectives; natural resource management objectives; visitor information; education and outreach objectives; general management objectives; and cultural resource management objectives.

Table 3.1 Recreational Objectives

Recreational Objectives	Goals				
	A	B	C	D	E
In cooperation with TPWD and the City of Grand Prairie, evaluate the demand for improved recreation facilities and increased public access on USACE-administered public lands and water for recreational activities (i.e. camping, walking, hiking, biking, boating, fishing, wildlife viewing, etc.) and facilities (i.e. campsites, picnic facilities, overlooks, all types of trails, boat ramps, courtesy docks, interpretive signs/exhibits, and parking lots).	*		*		
Monitor the condition and quality of day use and campground facilities within leased areas including, but not limited to: roads, sewer hook ups, potable water systems, electrical service, concrete or asphalt recreational vehicle pads, tent pads, restrooms, trails, pavilions, and park entrances.	*		*		
Monitor public use levels (with a special focus on boating congestion and marina capacity) and evaluate potential impacts from overuse and crowding. Take action to prevent/remediate overuse, conflict, and public safety concerns.	*		*		
Evaluate water surface classification and regulations with emphasis on designated quiet water or no-wake areas, natural resource protection, quality recreational opportunities, and public safety concerns.	*				
Follow the Environmental Operating Principles associated with recreational use of waterways for all water-based management activities and plans.		*	*		*
Encourage lessees to increase universally accessible facilities on Joe Pool Lake.	*		*		*
Consider flood/conservation pool elevations to address potential impact to recreational facilities (i.e. campsites, boat ramps, courtesy docks, etc.).	*	*	*	*	
Ensure consistency with USACE Recreation Strategic Plan.					*
Monitor the TCAP, the TORP, and adjacent municipality plans to insure that USACE is responsive to outdoor recreation trends, public needs and resource protection within a regional framework. All plans by others will be evaluated in light of USACE policy and operational aspects of Joe Pool Lake.	*	*	*		*

*Denotes that the objective helps to meet the specified goal.

Table 3.2 Natural Resource Management Objectives

Natural Resource Management Objectives	Goals:				
	A	B	C	D	E
Consider flood/conservation pool levels to ensure that natural resources are managed in ways that are compatible with primary project purposes of flood risk management and water supply.	*	*		*	
Ensure project lands are managed with preservation and conservation of natural habitat and open space as a primary objective in order to maintain availability of public open space.	*			*	
Actively manage and conserve fish and wildlife resources, especially migratory and other special status species, by implementing ecosystem management principles. Key among these principles is the use of native species adapted to the ecological region in restoration and mitigation plans.	*	*		*	*
Consider watershed approach during decision-making process.					*
Optimize resources, labor, funds, and partnerships for protection and restoration of fish and wildlife habitats.		*			*
Minimize activities that disturb the scenic beauty and aesthetics of the lake.	*	*	*	*	
Continually evaluate erosion control and sedimentation issues at Joe Pool Lake and develop alternatives to resolve the issues.	*	*			*
Address unauthorized uses of public lands such as off-road vehicle use, trash dumping, unauthorized fires, fireworks, poaching, clearing of vegetation, unauthorized trails and paths, and placement of advertising signs that create negative environmental impacts.	*	*	*	*	*
Monitor lands and waters for invasive, non-native, and aggressively spreading native species and take action to prevent and/or reduce the spread of these species. Potential invasive species of great concern are the zebra mussel, Chinese privet (<i>Ligustrum sinense</i>), and Emerald ash borer. Implement prescribed fire as a management tool to control the spread of noxious plants including Johnsongrass, King Ranch bluestem, and Ashe juniper, and to promote the vigor of native prairie grasses and forbs.	*	*		*	*

Natural Resource Management Objectives	Goals:				
	A	B	C	D	E
Protect and/or restore important native habitats such as riparian zones, wetlands, and native prairie where they occur, or historically occurred on project lands. Special emphasis should be taken to protect and/or restore special or rare plant communities, to include actions that promote butterfly and/or pollinator habitat, migratory bird habitat, and habitat for birds listed by USFWS as Birds of Conservation Concerns. Some of these habitats may be designated as Environmentally Sensitive Areas.	*	*	*	*	*
Administer the Shoreline Management Program to balance private shoreline uses (such as mowing or vegetation removal requests along the Federal property boundary, or paths to the shoreline) with wildlife habitat protection and impacts to public use.	*		*		

*Denotes that the objective helps to meet the specified goal.

Table 3.3 Visitor Information, Education, and Outreach Objectives

Visitor Information, Education, and Outreach Objectives	Goals				
	A	B	C	D	E
Provide more opportunities for communication with lessees, agencies, special interest groups, and the general public (i.e. comment cards, updates to City Managers, web page).	*			*	*
Implement more educational, interpretive, and outreach programs at the lake office and around the lake. Topics to include: history, lake operations (flood risk management and water supply), water safety, recreation, nature, cultural resources, ecology, and USACE missions.	*	*	*	*	*
Enhance network among local, state, and federal agencies in order to exchange lake-related information for public education and management purposes.	*			*	*
Increase public awareness of special use permits or other authorizations required for special activities, organized special events, and commercial activities on public lands and waters of the lake.	*	*	*		
Capture trends concerning boating accidents and other incidents on public lands and waters and coordinate data collection with other public safety officials.	*		*	*	*
Promote USACE Water Safety message.	*		*	*	*

Visitor Information, Education, and Outreach Objectives	Goals				
	A	B	C	D	E
Educate adjacent landowners on shoreline management policies and permit processes in order to reduce encroachment actions.	*	*	*	*	*

*Denotes that the objective helps to meet the specified goal.

Table 3.4 General Management Objectives

General Management Objectives	Goal				
	A	B	C	D	E
Maintain the USACE boundary line to ensure it is clearly marked and recognizable in all areas to reduce habitat degradation and encroachment actions.	*	*		*	
Secure sustainable funding for the shoreline management program.	*	*	*	*	*
Ensure consistency with USACE Campaign Plan (national level), IPlan (regional level), and OPlan (District level).					*
Ensure green design, construction, and operation practices, such as the Leadership in Energy and Environmental Design (LEED) criteria for government facilities, are considered as well as applicable Executive Orders.					*
Carefully manage non-recreation outgrants such as utility and road easements in accordance with national guidance set forth in ER-1130-2-550 and applicable chapters in ER 405-1-12.	*	*			*
Manage project lands and recreational programs to advance broad national climate change mitigation goals, including but not limited to climate change resilience and carbon sequestration, as set forth in USACE policy.					*

*Denotes that the objective helps to meet the specified goal.

Table 3.5 Cultural Resources Management Objectives

Cultural Resources Management Objectives	Goal				
	A	B	C	D	E
Monitor and coordinate lake development and the protection of cultural with lessees and appropriate entities.	*	*		*	*
Increase public awareness and education of regional history.		*		*	*
While currently no sites at Joe Pool Lake are listed on the National Register of Historic Places (NRHP), seven sites have been determined eligible and nine sites have not yet been		*		*	*

Cultural Resources Management Objectives	Goal				
	A	B	C	D	E
evaluated for NRHP eligibility. The project office will ensure any future historical preservation is fully integrated into the Joe Pool Lake Master Plan and the planning decision making process (Section 106 and 110 of the National Historic Preservation Act) on public lands surrounding the lake.					
Develop partnerships that promote and protect cultural resources at Joe Pool Lake.		*	*	*	*
Stop unauthorized use of public lands as it pertains to the illegal excavation and removal of cultural resources.		*		*	*

*Denotes that the objective helps to meet the specified goal.

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CHAPTER 4 -LAND ALLOCATION, LAND CLASSIFICATION, WATER SURFACE, AND PROJECT EASEMENT LANDS

4.1 LAND ALLOCATION

All lands at USACE water resource development projects are allocated by USACE into one of four categories in accordance with the congressionally authorized purpose for which the project lands were acquired. There are four possible categories of allocation identified in USACE regulations including Operations, Recreation, Fish and Wildlife, and Mitigation. At Joe Pool Lake, the land allocation categories that apply are Operations and Recreation. Operations allocation, is defined as those lands that are required to operate the project for the primary authorized purposes of flood risk management, hydroelectric power, and water conservation. Recreation allocation, is defined as lands acquired specially for the authorized purpose of recreation, referred to as separable recreation lands. The remaining allocations of Fish and Wildlife, and Mitigation would apply only if lands had been acquired specifically for these purposes. The entire fee simple federal estate at Joe Pool Lake is 15,067 acres of which 6,707 acres is inundated at conservation pool. Of the total 15,067 acres, 1,475 acres are allocated to Recreation with the remaining 13,592 acres allocated to Project Operations.

4.2 LAND CLASSIFICATION

Previous versions of the Joe Pool Lake Master Plan included land classification criteria that were similar to the current criteria. These prior land classifications were based more on projected need than on actual experience, which resulted in some areas being classified for a type of use that has not, or is not likely to occur. Additionally, in the 37 years since the previous Master Plan was published, wildlife habitat values, surrounding land use, and regional recreation trends have changed giving rise to the need for revised classifications. Refer to Table 8.1 in Chapter 8 for a summary of land classification changes from the prior classifications to the current classifications.

4.2.1 Current Land and Water Surface Classifications

USACE regulations require project lands and waters to be classified in accordance with the primary use for which project lands are managed. There are six categories of classification identified in USACE regulations including:

- Project Operations
- High Density Recreation
- Mitigation
- Environmentally Sensitive Areas
- Multiple Resource Management Lands
- Water Surface

The land and water surface classifications for Joe Pool Lake were established after taking into account public comments, input from key stakeholders including elected officials, city and county governments, and lessees operating on USACE land. Additionally, public comment, wildlife habitat values, and the trends analysis provided in TPWD's TORP and TCAP were also used in decision making. Maps showing the various land classifications can be found in Appendix A. Each of the land classifications, including the acreage and description of allowable uses is described in the following paragraphs.

4.2.2 Project Operations

This classification includes the lands managed for operation of the dam, project office, and maintenance yards, all of which must be maintained to carry out the authorized purpose of flood risk management. In addition to the operational activities taking place on these lands, limited recreational use may be allowed for activities such as public access to the road on top of the dam. Regardless of any limited recreation use allowed on these lands, the primary classification of Project Operations will take precedent over other uses. There are 308 acres of Project Operations land specifically managed for this purpose.

4.2.3 High Density Recreation (HDR)

These are lands developed for intensive recreational activities for the visiting public including day use areas, campgrounds, marinas and related concession areas. Recreation development by lessees operating on USACE lands must follow policy guidance contained in USACE regulations at ER 1130-2-550, Chapter 16. That policy includes the following statement:

“The primary rationale for any future recreation development must be dependent on the project’s natural or other resources. This dependency is typically reflected in facilities that accommodate or support water-based activities, overnight use, and day use such as marinas, campgrounds, picnic areas, trails, swimming beaches, boat launching ramps, and comprehensive resort facilities. Examples that do not rely on the project’s natural or other resources include theme parks or ride-type attractions, sports or concert stadiums, and standalone facilities such as restaurants, bars, motels, hotels, non-transient trailers, and golf courses. Normally, the recreation facilities that are dependent on the project’s natural or other resources, and accommodate or support water-based activities, overnight use, and day use, are approved first as primary facilities followed by those facilities that support them. Any support facilities (e.g., playgrounds, multipurpose sports fields, overnight facilities, restaurants, camp stores, bait shops, comfort stations, and boat repair facilities) must also enhance the recreation experience, be dependent on the resource-based facilities, and be secondary to the original intent of the recreation development...”

Lands classified for High Density Recreation are suitable for the development of comprehensive resorts. The regulation cited above defines Comprehensive Resort as follows:

“Typically, multi-faceted developments with facilities such as marinas, lodging, conference centers, golf courses, tennis courts, restaurants, and other similar facilities.”

At Joe Pool Lake, prior land classifications included a number of areas under the high density recreation classification. Several of these areas, including Cedar Hill State Park, Loyd Park, and portions of Lynn Creek and Britton Parks were developed during the construction phase of the overall project, while additional areas were selected for future development with the intent to manage the areas for wildlife in the interim. Using public, agency, and lessee input, the planning team changed the classification of some of these lands to reflect current and projected outdoor recreation needs and trends. At Joe Pool Lake there are 4,043 acres classified as High Density Recreation land. Refer to Table 2.23 for a listing of the recreation facilities currently provided at the four developed parks mentioned above. Each of the High Density Recreation areas is described briefly in Chapter 5 of this Plan.

4.2.4 Mitigation

This classification is used only for lands allocated for mitigation for the purpose of offsetting losses associated with the development of the project. There are no lands at Joe Pool Lake with this classification.

4.2.5 Environmentally Sensitive Areas (ESA)

These are areas where scientific, ecological, cultural, and aesthetic features have been identified. At Joe Pool Lake several distinct areas have been classified as Environmentally Sensitive Areas (ESA), primarily for the protection of sensitive habitats or cultural resources. Each of these areas is discussed in Chapter 5 of this Plan and illustrated on the maps in Appendix A. There are 1,507 acres classified as ESA at Joe Pool Lake.

4.2.6 Multiple Resource Management Lands (MRML)

This classification is divided into four sub-classifications identified as: Low Density Recreation, Wildlife Management, Vegetative Management, and Future/Inactive Recreation Areas. A given tract of land may be classified using one or more of these sub-classifications but the primary sub classification should reflect the dominant use of the land. Typically, Multiple Resource Management Lands support only passive, non-intrusive uses with very limited facilities or infrastructure. Where needed, some areas may require basic facilities that include, but are not limited to minimal parking space, a small boat ramp, and/or primitive sanitary facilities. There are 2,805 acres of land under this classification at Joe Pool Lake. The following paragraphs list each of the sub-classifications, and the number of acres and primary uses of each.

4.2.6.1 Low Density Recreation (LDR). These are lands that may support passive public recreational use (e.g., fishing, hunting, wildlife viewing, natural surface trails, hiking, etc.). Under prior land classifications, numerous areas were classified to support “low use” recreation and wildlife management. The planning process resulted in most of these areas be reclassified as either LDR or Wildlife

Management. In general, the relatively narrow tracts that have shoreline along the main body of the lake and are located immediately adjacent to residential areas have been reclassified as LDR. There are 578 acres under this classification at Joe Pool Lake.

4.2.6.2 Wildlife Management (WM). This land classification applies to those lands managed primarily for the conservation of fish and wildlife habitat. These lands generally include comparatively large contiguous parcels, most of which are located within the flood pool of the lake. Passive recreation uses such as natural surface trails, fishing, hunting, and wildlife observation are compatible with this classification unless restrictions are necessary to protect sensitive species or to promote public safety. There are 2,070 acres of land included in this classification at Joe Pool Lake.

4.2.6.3 Vegetative Management (VM). These are lands designated for stewardship of forest, prairie, and other native vegetative cover. Passive recreation activities previously described may be allowed in these areas. There are 157 acres of land included in this classification at Joe Pool Lake. Photo 4.1 provides a before and after picture of an area in Cedar Hill State Park that is periodically burned to promote native prairie.

Photo 4.1 Before and after picture of an area in Cedar Hill State Park that is periodically burned to encourage establishment of native prairie.



Photo courtesy of TPWD

4.2.6.4 Future or Inactive Recreation. These are lands with site characteristics compatible with High Density Recreation development. Prior land classifications at Joe Pool Lake identified several tracts for future Recreation – High Use

development with an Interim Wildlife Management Classification, all of which are leased to the City of Grand Prairie. One such area is in the western portion of Lynn Creek Park where recreation development is underway. The City of Grand Prairie requested the classification of all areas with a prior classification of future Recreation – High Use / Interim Wildlife Management be changed to HDR, with the exception of a 96-acre portion of Estes Park lying west of Lakeridge Parkway which, in response to public comment, was reclassified as MRML-LDR. The City projects that these tracts will be developed within the 25-year planning horizon of this Master Plan. There are no areas classified as Future or Inactive Recreation.

4.2.7 Water Surface

USACE regulations specify four possible sub-categories of water surface classification. These classifications are intended to promote public safety, protect resources, or protect project operational features such as the dam and spillway. These areas are typically marked by USACE or lessees with navigational or informational buoys or signs, or are denoted on public maps and brochures. The Water Surface Classification map can be found in Appendix A of this Plan. The four sub-categories of water surface classification include:

- Restricted. Restricted water surface includes those areas where recreational boating is prohibited or restricted for project operations, safety, and security purposes. The areas include the water surface immediately surrounding the gate control tower upstream of the Joe Pool Lake Dam as well as around the TRA and City of Midlothian water intake towers and designated swim beaches at Joe Pool Lake parks. There are 24 acres of restricted water surface at Joe Pool Lake.
- Designated No-Wake. Designated No-Wake areas are intended to protect environmentally sensitive shorelines and improve boating safety near key recreational water access areas such as boat ramps. There are 7 boat ramps and one marina at Joe Pool Lake where no-wake restrictions are in place for reasons of public safety and protection of property. There are 103 acres of designated no-wake water surface at Joe Pool Lake.
- Fish and Wildlife Sanctuary. This water surface classification applies to areas with annual or seasonal restrictions to protect fish and wildlife species during periods of migration, resting, feeding, nesting, and/or spawning. Joe Pool Lake has no water surface areas designated as a Fish and Wildlife Sanctuary.
- Open Recreation. Open Recreation includes all water surface areas available for year round or seasonal water-based recreational use. This classification encompasses the majority of the lake water surface and is open to general recreational boating. Boaters are advised through maps and brochures, or signs at boat ramps and marinas, that navigational hazards, including areas

where standing dead timber may be present as depicted on the land and water surface classification maps in Appendix A, may be present at any time and at any location in these areas. Operation of a boat in these areas is at the owner's risk. Specific navigational hazards may or may not be marked with a buoy. There are 6,580 acres of open recreation water surface at Joe Pool Lake.

Future management of the water surface includes the maintenance of warning, information, and regulatory buoys as well as routine water safety patrols during peak use periods.

4.2.8 Recreational Seaplane Operations

Seaplane restrictions are part of Title 36 Code of Federal Regulations. At Joe Pool Lake and other USACE lakes across the nation, areas where recreational seaplane operations are prohibited were established through public meetings and environmental assessments circa 1980. The seaplane policy for USACE Fort Worth District is found in the Notice to Seaplane Pilots (see Appendix E), which lays out the general restrictions as well as lake-specific restrictions for seaplane operation. Seaplane operations at Joe Pool Lake are generally prohibited in all areas west of the Lakeridge Parkway Bridges and within 500 feet of structures such as bridges and the dam. Once on the water, seaplanes are considered to be water vessels and fall under guidelines for watercraft.

Table 4.1 provides a summary of land classifications at Joe Pool Lake. Acreages were calculated by historical and GIS data. A map representing these areas can be found in Appendix A.

Table 4.1 Land Classification Acres at Joe Pool Lake

CLASSIFICATION	ACRES
Project Operations	308
High Density Recreation	4,043
Environmental Sensitive Areas	1,507
Multiple Resource Managed Lands - Low Density Recreation	578
Multiple Resource Managed Lands - Wildlife Management	2,070
Multiple Resource Managed Lands - Vegetative Management	157
Multiple Resource Managed Lands - Future/Inactive Recreation Areas	0
Water Surface: Restricted	24
Water Surface: Designated No-Wake	103
Water Surface: Fish and Wildlife Sanctuary	0
Water Surface: Open Recreation	6,580

Note: Acreages were measured using GIS technology and may vary slightly from the official land acquisition records. Acreage varies depending on changes in lake levels, sedimentation and shoreline erosion.

4.3 PROJECT EASEMENT LANDS

Project Easement Lands are lands on which easement interests were acquired. Fee title was not acquired on these lands, but the easement interests convey to the Federal government certain rights to use and/or restrict the use of the land for specific purposes. Easement lands are typically acquired for Right-Of-Way Easements, and Flowage Easements. Flowage easement lands exist for one primary purpose. A flowage easement, in general, grants to the government the perpetual right to temporarily flood lands encumbered with the easement and to protect the easement by prohibiting the landowner from taking any action that might injure or destroy the easement. Although provisions may vary in individual flowage easement deeds, most prohibit placement of habitable structures on the flowage easement and require written consent for the placement of any fill or structures on the easement. There are approximately 1,904 acres of flowage easements lands at Joe Pool Lake.

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CHAPTER 5 - RESOURCE PLAN

5.1 MANAGEMENT BY CLASSIFICATION

This chapter describes the management plans for each land use classification within the Master Plan. The classifications that exist at Joe Pool Lake are Project Operations (PO), High Density Recreation (HDR), Environmentally Sensitive Area (ESA), and Multiple Resource Management Lands (MRML) on which a predominant use is specified including Low Density Recreation (LDR), Vegetative Management (VM) and Wildlife Management (WM). The water surface is also classified into sub-classifications of Restricted, Designated No Wake, and Open Recreation. The management plans describe how these project lands and water surface will be managed in broad terms. A more descriptive plan for managing these lands can be found in the Joe Pool Lake OMP or the park master plans prepared by TPWD or the City of Grand Prairie. Acreages shown for the various land classifications was calculated using GIS technology and may not agree with lease documents, prior publications, or official land acquisition records.

5.2 PROJECT OPERATIONS

The Project Operations (PO) classification is land associated with the dam, spillway, levees, lake office, maintenance facilities, and other areas managed solely for the operation and fulfillment of the primary mission of the project. There are 308 acres of lands under this classification, all of which are managed by the USACE. For several years, USACE has allowed public pedestrian traffic on the operational service road that traverses the top of the dam. This use was recently discontinued while the service road and several minor earthen slides on the dam are being repaired. This recreational public use is considered by USACE to be incidental to operational needs and is subject to termination if necessary for project operational purposes. When current repairs are completed, USACE will evaluate the continued use of the service road by pedestrians and bicyclists. Regardless of the decision whether or not to continue public use of the service road, future dam maintenance needs or security concerns could result in cessation of this use. The stilling basin includes walkways to accommodate fishing, and pedestrian access to the stilling basin area is currently allowed from the access gate on Camp Wisdom Road to the stilling basin. This recreational use is also considered by USACE to be incidental to operational needs and could be curtailed in the future to accommodate operational or security requirements. The management plan for the PO lands is to continue providing physical security necessary to ensure sustained operations of the dam and related facilities including restricting public access in hazardous locations near the dam and spillway.

Photo 5.1 Construction of Joe Pool Dam, early 1980s



USACE Photo

5.3 HIGH DENSITY RECREATION

Joe Pool Lake has 4,043 acres classified as High Density Recreation (HDR). These lands are referred to as parks and are developed, or suitable to be developed, for intensive recreational activities for the visiting public including day use areas, campgrounds and commercial concessions within the areas classified as HDR. Other land classifications exist within designated parks including ESA, MRML-WM, MRML-LDR, and MRML-VM lands. As of the date of publication of this Master Plan, the City of Grand Prairie has seven distinct areas under lease from USACE, three of which are wholly or partly developed. TPWD has one large parcel, Cedar Hill State Park (formerly Lakeview State Park), under lease.

The initial development of recreation facilities at Joe Pool Lake was cost shared through contractual agreements between USACE and TRA for the HDR lands currently leased to and operated by the City of Grand Prairie, and between USACE and TPWD for the development of Cedar Hill State Park. With the exception of commercial concession areas operated under sublease arrangements with either the City of Grand Prairie or TPWD, any future development, and all operations and maintenance costs associated with these HDR lands is the responsibility of TPWD and the City of Grand Prairie for their respective leased areas. USACE reviews requests from lessees and ensures compliance with applicable laws and regulations for proposed and on-going activities in all leased HDR areas. USACE works with partners to ensure that recreation areas are managed and operated in accordance with the objectives prescribed in Chapter 3. Entry into HDR areas by the general public, including adjacent landowners,

is generally allowed only through controlled access entrance gates. USACE is responsible for passive recreation uses occurring on project lands that are not leased to others.

National USACE policy set forth in ER 1130-2-550, Chapter 16, limits recreation development on USACE lands to those activities that are dependent on a project's natural resources and typically includes water-based activities, overnight use and day use such as marinas, campgrounds, picnic areas, trails, swimming beaches, boat launching ramps and comprehensive resorts. Examples of activities that are not dependent on a project's natural resources include, athletic fields for organized sports, theme parks or ride-type attractions, sports or concert stadiums, and stand-alone facilities such as restaurants, bars, motels, hotels, and golf courses.

The currently developed parks operated by TPWD and the City of Grand Prairie are listed in Chapter 2 in Table 2.23. The primary recreation facilities offered in each park are listed in the table.

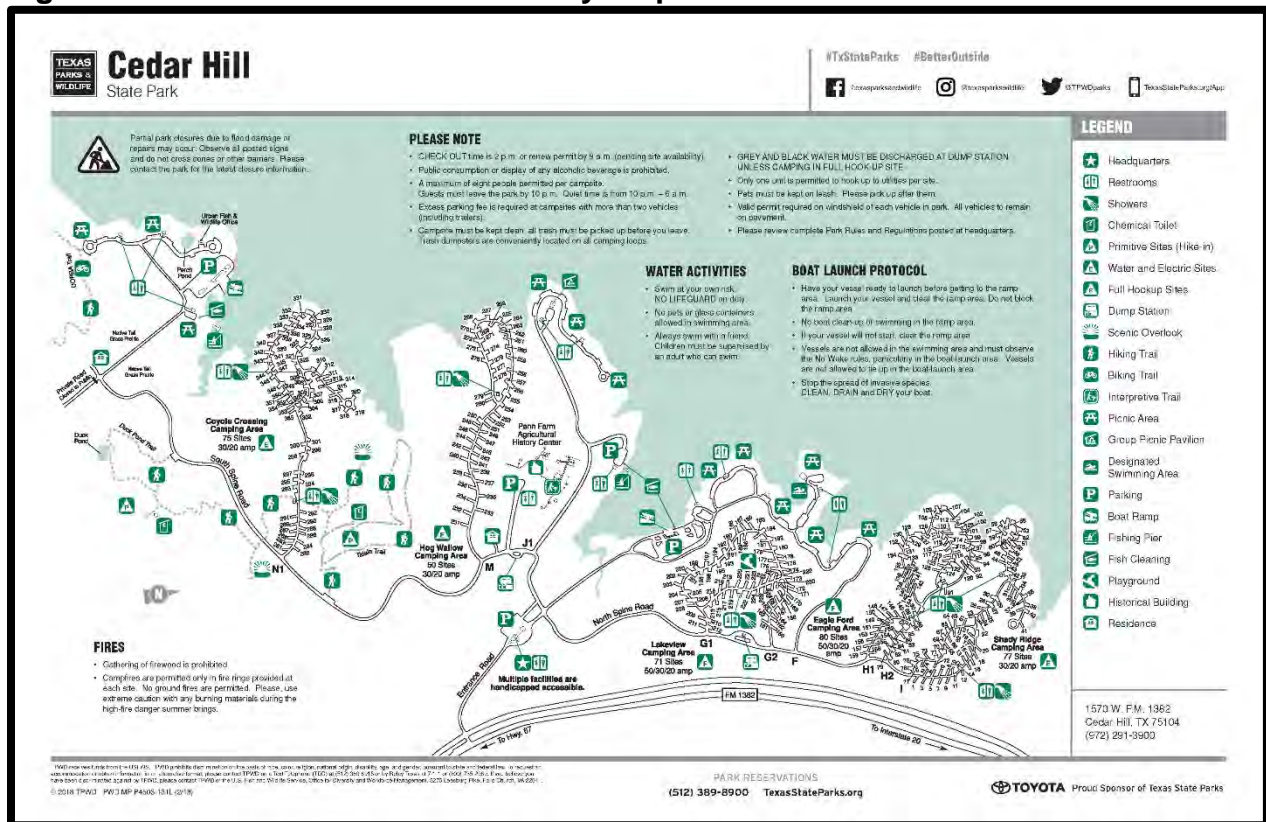
5.3.1 The current developed parks at Joe Pool Lake consist of the following:

Cedar Hill State Park (CHSP): This large and comprehensive park is located on approximately 1,943 acres along the northeastern shore of Joe Pool Lake. The park is oriented in a northeast/southwest direction and is approximately 5 miles long and varies in width from 1.3 miles to .5 miles. The northeastern half of the park is highly developed with campsites, day use facilities, and the Penn Farm Agricultural History Center, whereas the southwestern half of the park is largely undeveloped but is traversed by three off-road bicycle trails. CHSP is one of the largest and most heavily used state parks in the state park system. Its central location in the Dallas-Fort Worth metropolitan area provides easy access to a very large and growing population. See Figure 5.1 for a map of the developed portion of Cedar Hill State Park.

In workshops and site visits with TPWD park staff, it was explained by TPWD that the current management priority for the park is to repair extensive flood damage that occurred during the high pool elevations of 2015 and 2016. The flooding severely affected several areas in the park and planning is underway for a major redevelopment of the large 25+ year old day use area in and around the current swimming beach. This effort is funded and completion anticipated during 2021. Numerous campsites and day use sites were affected by the flooding and are being repaired or relocated. The park has ample acreage for additional development, but there are currently no definite plans for expansion.

For a number of years, a commercial marina operated under a sublease agreement with TPWD in the north end of the park. The marina closed, and all facilities were removed in 2017. TPWD intends to retain the authorization to place another marina on the lake at some future date, but no definite plans have been made.

Figure 5.1 Cedar Hill State Park Facility Map



Source: TPWD

City of Grand Prairie Parks

The City of Grand Prairie has a lease agreement with USACE for seven distinct parcels including the following: Lynn Creek Park, Loyd Park, Britton Park, Estes Park, Low Branch Park, Pleasant Valley Park and Camp Wisdom Park. Three of the parks, Lynn Creek, Loyd, and Britton Parks are partly or wholly developed. The remaining four parks are currently undeveloped.

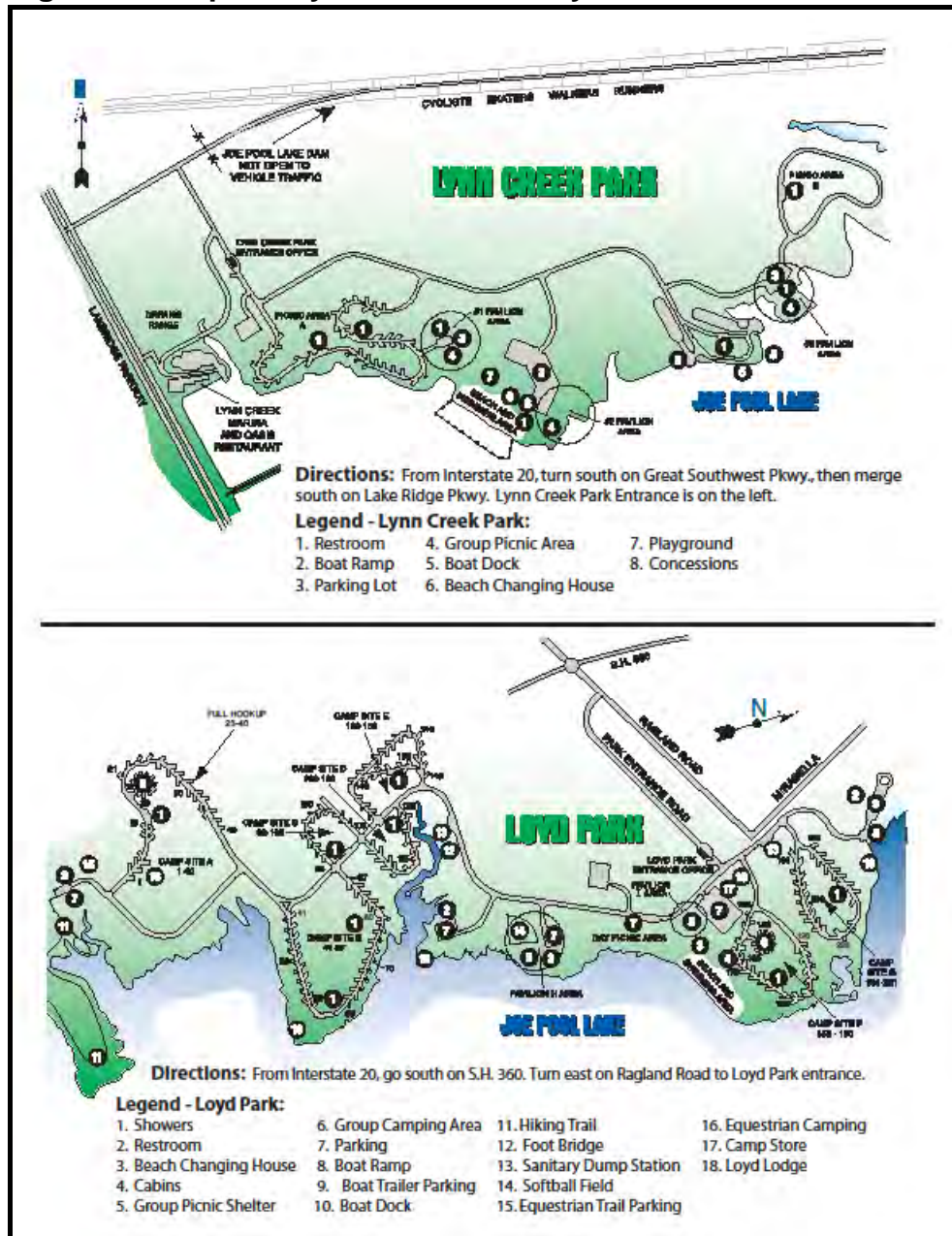
The City has provided USACE conceptual development proposals for each of their leased parks for the time period 2014-2019. Some proposed items have been approved and are in place such as cabins and a lodge facility in Loyd Park, and natural surface trails in the western portion Lynn Creek Park. Other items have not been approved due to the need for additional review and/or conflicts with USACE policy noted above. Inclusion of conceptual development proposals in this Plan does not convey approval of any given item. Each proposal ultimately requires specific written approval from USACE, and depending on the complexity of a given action may require separate documentation pursuant to the National Environmental Policy Act (NEPA) in the form of an Environmental Assessment. Each of the developed parks are described as follows:

Lynn Creek Park: This gate-controlled, 778-acre park serves primarily day users and marina patrons. The park is easily accessed from Lakeridge Parkway and from Highway 360 by way of Mildred Walker Parkway. Approximately the eastern two-thirds of the park is developed with numerous picnic sites, pavilions, a swimming beach, three boat ramps (one at the marina), and a playground. A walking trail is also maintained in the eastern portion of the park, and walkers and bicyclists are currently able to access the road on top of the dam from within the park. The western third of the park is largely undeveloped, but walking trails and a trailhead were recently added on the north side of Mildred Walker Parkway. Lynn Creek Marina, including a full service restaurant, are conveniently located adjacent to Lakeridge Parkway. The marina is operated under a sublease agreement with the City of Grand Prairie. Also present in the park is a city-operated fire and police station and a small city office complex. This type of city infrastructure is generally not allowed in park areas, but authorization was granted as part of the lease transfer from TRA to the City of Grand Prairie.

Future plans for Lynn Creek Park that appear compatible with USACE policy include a variety of actions aimed at enhancing the visitor experience. Examples of proposed actions include expansion of lake-oriented day use facilities, a large multi-use pavilion, fish cleaning station, children's playground, paddle craft rentals, and concessions in high use areas.

Loyd Park: This gate-controlled, 743-acre park serves primarily campers. The park is fully developed with campsites; several cabins and a lodge with 15 bedrooms, full kitchen and a meeting room; camp store; and paddle craft rentals. Walnut Creek and associated riparian woodlands is located within the park and is classified as an Environmentally Sensitive area. Hiking paths and a paddle trail on Walnut Creek are within the ESA and are an important park amenity. Future plans for Loyd Park described by the City of Grand Prairie include additional full service campsites, additional cabin-type structures, a new gatehouse, existing campsite upgrades, pavilions, and a fish cleaning station. A map of Loyd Park and the developed portion of Lynn Creek Park is provided at Figure 5.2.

Figure 5.2 Maps of Lynn Creek and Loyd Parks



Source: City of Grand Prairie

Britton Park: This 115-acre park serves as a boat ramp location in the upper end of the Mountain Creek arm of Joe Pool Lake. The ramp has two lanes, and the park is open to bank fishing. A self-pay station is provided in the park. Approximately 87 acres of the park located north of the boat ramp complex is classified as MRML-WM. This 87-acre portion would be suitable for natural surface pedestrian trails. Future developments proposed by the City of Grand Prairie include picnic sites, natural surface trails, and a park attendant site. A map of Britton Park is provided in Appendix A.

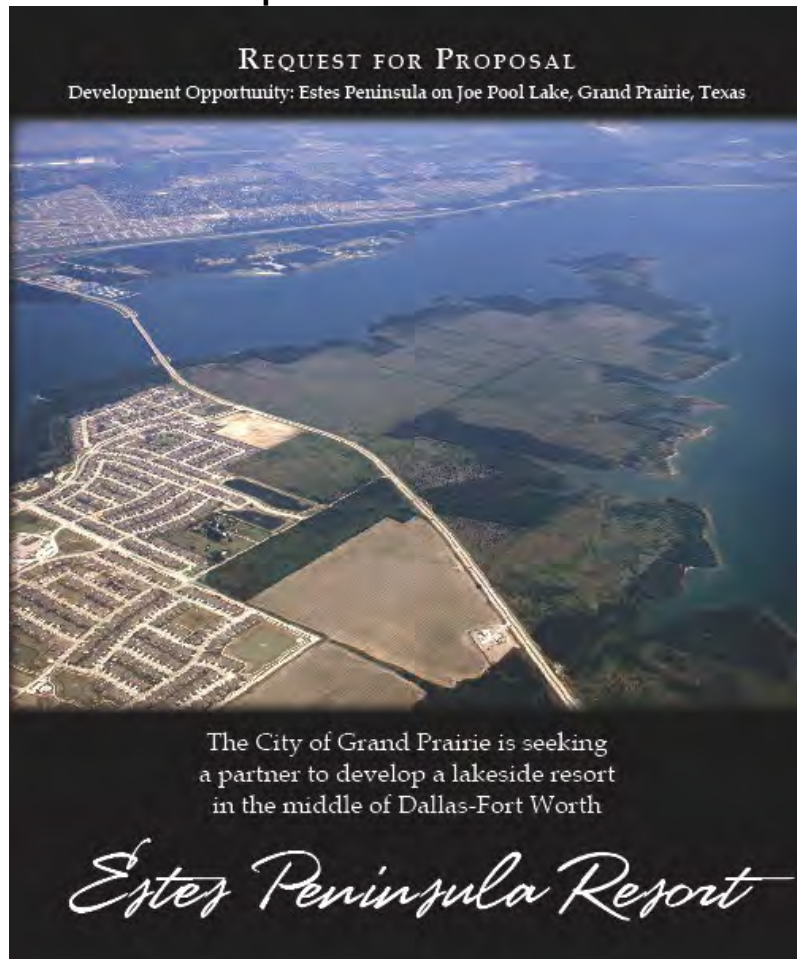
Undeveloped Parks

The four undeveloped parks currently leased to the City of Grand Prairie include Camp Wisdom Park, Estes Park, Low Branch Park, and Pleasant Valley Park. Each of these parks are described as follows:

Camp Wisdom Park: This 186-acre park is located downstream from the dam at the intersection of FM 1382 and Camp Wisdom Road. The park acreage includes 98 acres of HDR land and 91 acres of MRML - LDR land. The City of Grand Prairie has expressed interest in expanding the acreage of this park to include USACE land located southeast of the current park boundary up to the FM 1382 and the access road leading to the USACE lake office. The expansion area is currently classified as MRML – WM and would remain under that classification if added to the current lease. Future development proposed by the city includes an equestrian facility.

Estes Park: Estes Park has been slated for development of a comprehensive resort facility dating back to the original 1981 Master Plan. The City of Grand Prairie is currently soliciting proposals from developers to place a comprehensive resort on the peninsula. Earlier attempts to develop Estes Park, first by TRA and then by Grand Prairie did not attract a developer, but the city is hopeful that current socioeconomic conditions will bring success. Land classification changes made as part of this Plan expanded Estes Park from 1,057 acres to 1,138 acres. Currently, the City of Grand Prairie holds a lease for the original 1,057 acres and intends to pursue a lease amendment to expand their lease to the full 1,138 acres. USACE will coordinate closely with the city as plans are reviewed for the resort development and possible lease expansion. The city's 2016 park master plan calls for development of the resort in Estes Park within the ten year planning horizon of the plan. If the City receives a proposal, USACE will review the proposal and prepare an Environmental Assessment (EA) pursuant to the National Environmental Policy Act (NEPA) and will make the EA available for public comment.

Figure 5.3 Cover Page of Request for Proposals to Develop Estes Park



Source: City of Grand Prairie

Low Branch Park: This 129-acre park is located south of Lakeridge Parkway on the west side of the Mountain Creek arm of the lake. The city has no immediate plans to develop the park. Fifteen acres of this park is currently being utilized as a radio control aircraft field.

Pleasant Valley Park: This 265-acre Park is located south of Lakeridge Parkway on the east side of the Mountain Creek arm of the lake. The park includes a 69-acre ESA located on a riparian corridor on the east side of the park. The city's 2016 master plan calls for the park to be developed within the plan's 10-year planning horizon to have a neighborhood park atmosphere with some level of typical lakeside development.

A map showing the location of Camp Wisdom, Estes, Low Branch, Britton, and Pleasant Valley Parks is provided in Appendix A.

5.4 MITIGATION

This classification is applied to lands that were acquired specifically for the purpose of offsetting losses associated with development of the project. There are no acres at Joe Pool Lake under this classification. USACE lands at Joe Pool Lake where environmental mitigation activities have taken place in association with real estate easements or other outgrants are not included in lands classified for Mitigation.

5.5 ENVIRONMENTALLY SENSITIVE AREAS

Eight areas totaling approximately 1,507 acres at Joe Pool Lake were selected by the planning team for classification as ESA. The results of the Wildlife Habitat Appraisal Procedure conducted on October 2-5, 2017, were used, in part, to assist in determining which areas should be classified as ESA. Other factors, including public and stakeholder comment, the presence of cultural resources, presence of species of conservation concern, and visual esthetics were also included in the selection of ESA areas. By definition, these areas are to be protected from intense development or disturbance from future land use actions such as utility or road easements. Passive public use such as natural surface trails, bank fishing, and nature study are appropriate for these areas.

Each of these areas are numbered on the land classification maps in Appendix A. Table 5.1 provides a listing of the ESA areas, including habitat type, acreage, WHAP scores and a location description. Each area, including future management priorities, is briefly described as follows:

- ESA 1 – Mountain Creek Riparian Area. This 87-acre ESA is the riparian corridor along the left and right banks of Mountain Creek discharge channel below Joe Pool Dam. The area has relatively high habitat value in downstream areas, but these values are anticipated to gradually improve on the entire area over time. . Supplemental tree plantings to increase the percentage of hard mast producing trees, as well as control of any invasive species such as Chinese privet, are management priorities for the area. The discharge channel was excavated by USACE through the woodlands below the dam and is maintained by USACE. While USACE will endeavor to protect the habitat integrity of the ESA, maintenance of the channel may require periodic disturbance of the area.
- ESA 2 – Shoreline West of Gate Control Tower. This comparatively small, 10-acre parcel is located west of the USACE gate control tower. No WHAP sample points were placed in this area and the primary value of the site is related to the presence of cultural resources. Protection of this area from disturbance is a priority. Passive use of the area for natural surface trails and bank fishing are appropriate. The area is managed by USACE.
- ESA 3 – Buffer Along Downstream Toe of Dam. This comparatively narrow, 114-acre strip of land is parallel to the downstream toe of Joe Pool

Dam. The area consists of transitioning old agricultural fields and serves as an important buffer between the dam and nearby residential development. The area is periodically utilized for mitigation plantings associated with various real estate outgrant actions. Improving the wildlife habitat value of the area through supplemental plantings, and maintaining the area as a visual and esthetic buffer are priorities for this area. The area is managed by USACE.

- ESA 4 – Lynn Creek Riparian Corridor. This small 15-acre area is a riparian corridor on both banks of Lynn Creek in the extreme west end of Lynn Creek Park. No WHAP points were placed in the area, but the area exhibits potential for high habitat value and serves to filter surface water runoff before it enters Joe Pool Lake. The area is part of Lynn Creek Park and is managed by the City of Grand Prairie. USACE can work cooperatively with the city to improve the wildlife habitat value of the area. Passive use such as natural surface trails and general pedestrian access are appropriate for the area.
- ESA 5 – Walnut Creek Riparian Corridor. This 580-acre area consists primarily of relatively undisturbed bottomland hardwood habitat where Walnut Creek enters Federal land. The area is part of Loyd Park operated by the City of Grand Prairie and is utilized for natural surface trails. The Walnut Creek channel is promoted by Grand Prairie as a paddle trail. The entire area has high wildlife habitat value and serves as a filter for surface water runoff. USACE can work cooperatively with the city to maintain and improve the area for wildlife habitat.
- ESA 6 – Low Branch Riparian Corridor. This 120-acre area is a riparian corridor on both banks of Low Branch. The area has relatively high wildlife habitat value and serves as a filter for surface water runoff. Supplemental plantings to improve wildlife habitat values, and control of invasive species are management priorities. Passive use of the area for natural surface trails and nature study are appropriate for the area. The area is managed by USACE.
- ESA 7 – Pleasant Valley Riparian Corridor. This relatively narrow, 69-acre parcel is part of Pleasant Valley Park leased to the City of Grand Prairie. The area has relatively high wildlife habitat value and serves as a filter for surface water runoff. USACE can work cooperatively with the city to improve wildlife habitat values on the area.
- ESA 8 – Cedar Hill State Park ESA Parcels. This 512-acre area is a collection of numerous parcels within Cedar Hill State Park and was mapped by TPWD personnel. The areas were selected to emphasize the high wildlife habitat value of riparian corridors as well as the known cultural resources within the park. TPWD intends to implement wildlife

habitat improvement measures on the parcels and will continue to protect the integrity of cultural resource sites. Passive recreational use in the form of natural surface trails and nature study is appropriate.

Table 5.1 ESA Listing

ESA Area Number¹	Acres	WHAP Scores Per Sample Point Number	Location/Description
1 – RBLH	87	Point 66 (.75)	Mountain Creek Riparian Corridor Below Dam
2 - NA	10	NA	Shoreline West of Gate Control Tower
3 - DF	114	Point 64 (.49)	Buffer Along Downstream Toe of Dam West of Spillway
4 - RBLH	15	NA	Lynn Creek Riparian Corridor
5 - RBLH	580	Point 50 (.81)	Walnut Creek Riparian Corridor Upstream and Downstream from Highway 360
6 - RBLH	120	Point 37 (.68)	Low Branch Riparian Corridor
7 - DF	69	Point 16 (.75)	Riparian Corridor on East side of Pleasant Valley Park
8 – RBLH and DF	512	22 Total Points	Cedar Hill State Park – Five Distinct Parcels and One Cluster of Several Parcels

¹RBLH – Riparian Bottomland Hardwoods; DF-Deciduous Forest;

Photo 5.2 ESA # 5: Walnut Creek Riparian Area



5.6 MULTIPLE RESOURCE MANAGEMENT LANDS

Multiple Resource Management Lands (MRML) at Joe Pool Lake are organized into three sub-classifications. These sub-classifications are Low Density Recreation, Wildlife Management, and Vegetative Management. The following is a description of each sub-classification's resource objectives, acreages, and description of use.

- Low Density Recreation (LDR). These lands are generally narrow parcels of land that are adjacent to private residential developments. Future management of these lands calls for maintaining a healthy, ecologically adapted vegetative cover to reduce erosion and improve aesthetics. Prevention of unauthorized use such as trespass or encroachments is an important management objective for all USACE lands, but is especially important for those lands in close proximity to private development. These lands are typically open to the public, including adjacent landowners, for pedestrian traffic and are frequently used by adjacent landowners for access to the shoreline near their homes. Adjacent landowners may apply for a permit to mow a meandering path to the shoreline, and if conditions warrant, may apply for a permit to mow a narrow strip along the USACE boundary line as a precaution against wildfire. The general public may use these lands for bank fishing, hiking, and for access to the shoreline. An exception to access by adjacent landowners or the general public may exist on any LDR area that is operated as a controlled access park area. Future uses may include additional designated natural surface hike and bike trails. There are

578 acres classified as Low Density Recreation. With the exception of 91 acres of LDR land located in Camp Wisdom Park, and 96 acres in Estes Park that are leased to the City of Grand Prairie, all other LDR lands are managed by USACE.

- Wildlife Management. These are lands designated primarily for the stewardship of fish and wildlife resources, but are open to passive recreation use such as natural surface trails, hiking, and nature study. There are currently 2,070 acres under this classification and with the exception of 87 acres in Britton Park that are leased to the City of Grand Prairie, these lands are managed by USACE. The majority of these lands are prior agricultural fields and management priority will be to restore these lands to support native vegetation adapted to soil type and elevation with respect to the flood control pool. Where topography, soil type, and hydrology are suitable, areas within the Mountain Creek floodplain may be selected for wetland development.
- Vegetative Management. These are lands that have native vegetative types considered to be sensitive and needing special classification to ensure protection. At Joe Pool Lake, TPWD has selected several parcels within Cedar Hill State Park to be placed in this classification. The parcels were selected to recognize current and future native prairie restoration efforts. Efforts to date have required clearing of woody species on select parcels that are good candidates for prairie restoration. These areas are periodically burned to promote the native grasses and forbs already present on the sites. Currently there are 157 acres classified for the primary use of Vegetative Management, all within CHSP.

Photo 5.3 Prescription burn to promote native grasses and forbs in Cedar Hill State Park.



Photo courtesy of TPWD

Photo 5.4 Prairie restoration site following removal of woody species and prescription burning, Cedar Hill State Park



USACE Photo

- Future/Inactive Recreation Areas. These are areas with site characteristics compatible with potential future recreational development or recreation are that are closed. Until there is an opportunity to develop or reopen these areas, they will be managed for multiple resources. There are no acres classified under this sub-classification at Joe Pool Lake.

5.7 WATER SURFACE

At conservation pool level of 522.0 NGVD there are 6,707 acres of surface water. Buoys are managed by USACE, Grand Prairie, TPWD, the City of Midlothian, and TRA in their respective areas. These buoys help mark hazards, swim beaches, boats keep-out, and no-wake areas.

- Restricted. Restricted areas are around swim beaches, public water supply intakes and near the USACE gate control tower on the dam. Vessels are not allowed to enter Restricted water surface. Water surface zoned as restricted totals approximately 24 acres.
- Designated No-wake. No-wake areas are located near boat launch areas for the safety of launching and loading boats or personal watercraft, and in areas where boats approach marinas. At Joe Pool Lake, no-wake buoys are posted along the Lakeridge Parkway bridges. Growing interest in paddle boats indicates a possible need for designated no-wake areas where paddle boats can be operated without competing with motorized vessels. The City of Grand Prairie maintains a paddle

trail that originates at the south end of Loyd Park and proceeds up Walnut Creek. In Cedar Hill State Park, TPWD offers training classes in the use of kayaks. USACE is open to the concept of paddle trails and will work with interested parties to fulfill this need. Currently, approximately 103 total acres of Joe Pool Lake is designated for no-wake.

- Fish and Wildlife Sanctuary. These areas are managed with annual or seasonal restrictions to protect fish and wildlife species during periods of migration, resting, feeding, nesting, and/or spawning. There are no water surface acres under this classification at Joe Pool Lake.
- Open Recreation. The remaining lake area not in the above classifications is open to recreational use. No specific zoning exists for these areas, but the buoy system mentioned above is in place to help aid in public safety. During the construction phase of Joe Pool Lake, timber and man-made structures were cleared in the majority of the lake area lying below the conservation pool elevation of 522.0 feet NGVD. In select areas, only man-made structures were removed but timber was allowed to remain standing to provide structure for fish populations. As a result, standing dead timber exists over approximately 1,777 acres of the lake water surface. These uncleared areas are depicted on the land and water surface classification maps in Appendix A. These uncleared areas, as well as areas where the timber was cleared, are included in the Open Recreation designation. It is incumbent on boaters to be aware of lake conditions and to operate vessels responsibly. Approximately 6,580 acres of Joe Pool Lake is classified for Open Recreation.

Photo 5.5 Kayak training class in Cedar Hill State Park.



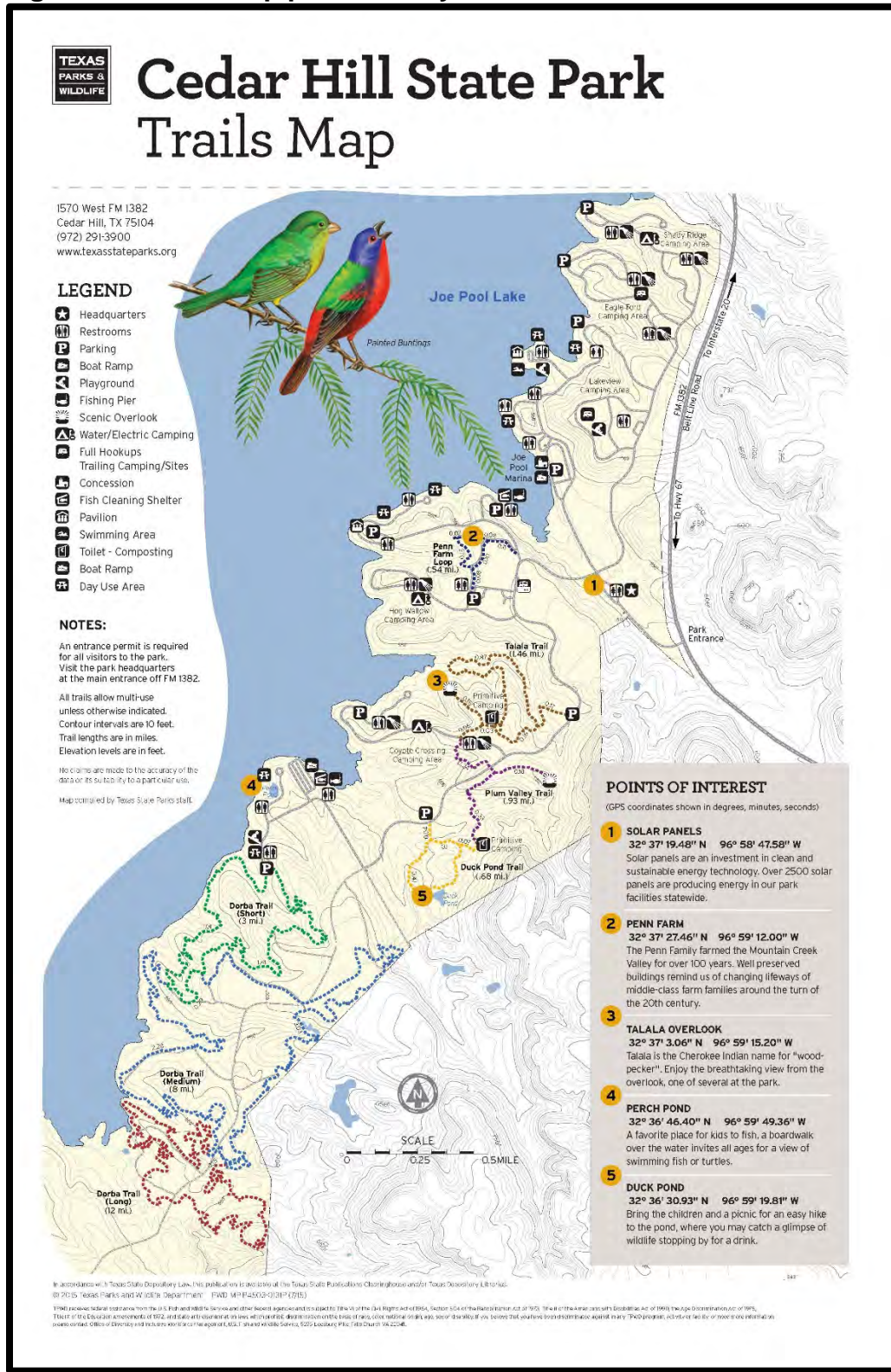
Photo courtesy of TPWD

Future Management of the Water Surface. Future management of the water surface includes the maintenance of warning, information, and regulatory buoys as well as routine water safety patrols during peak use periods. Currently water safety patrols are conducted by the City of Grand Prairie, TPWD Game Wardens, and USACE Park Rangers. USACE hopes to conduct a comprehensive Recreational Boating Study at Joe Pool Lake at some date in the future. See Chapter 6 for a full discussion of the need for a Recreational Boating Study.

5.8 TRAILS

Each managing entity at Joe Pool Lake; USACE, TPWD, and the City of Grand Prairie; provide trail opportunities to some degree. For several years, USACE has allowed walkers and bicyclists on the service road on top of the dam, but this use was recently stopped while repairs are being made to the road surface and minor earthen slides on the dam. USACE considers this recreational use of the service road to be incidental to the primary use of the road for project operations. As of the date of this Plan, a date has not been set for completion of repairs. When repairs are completed, USACE will evaluate the potential for continued use of the service road by walkers and bicyclists. TPWD provides nature trails, hiking trails, and mountain biking trails within CHSP (see Figure 5-2), and Grand Prairie provides hiking trails in Lynn Creek Park and Loyd Park. Each entity, as well as other potential partners have expressed a common interest in pursuing a multi-agency / multi-partner trail that would circumnavigate the lake. Such a trail would likely traverse on and off Federal land and would require use of all USACE land classifications. USACE supports this concept and will work with partners in the future to achieve this ambitious plan. Several lake projects within the USACE Fort Worth District have similar trail opportunities. Grapevine Lake is a good example where the majority of the lake perimeter is currently traversed by hike/bike/and equestrian trails that are managed by multiple entities including volunteer groups such as the Dallas Off-Road Bicycle Association and the Texas Equestrian Trail Riders Association. Based on the level of public use occurring on existing trails at nearby USACE lakes, a trail circumnavigating Joe Pool Lake would be heavily used.

Figure 5.4 Trails Map produced by TPWD for Cedar Hill State Park



CHAPTER 6 - SPECIAL TOPICS/ISSUES/CONSIDERATIONS

6.1 UTILITY CORRIDORS

USACE policy encourages the establishment of designated corridors on project lands, where feasible, to serve as the preferred location for future outgrants such as easements for roads or utility lines. After obtaining public input and examining the location of existing roads and utility lines on project lands, USACE determined that only utility corridors would be designated at Joe Pool Lake.

The following seven utility corridors have been designated across USACE land at Joe Pool Lake with each corridor incorporating and/or running parallel to an existing easement. These corridors are shown on map number JP18MP-OU-01 provided in Appendix A. Future use of these corridors, where the corridor is limited to or incorporates an existing easement, would in most cases require prior approval of those entities that have legal rights to the easement. Some existing easements at Joe Pool Lake, such as the TRA sewer line that runs through Loyd Park, and the Cedar Hill sewer line that runs through portions of Cedar Hill State Park, have not been designated as corridors. These non-corridor easements may be used for placement of additional utilities by the grantee holding the easement, but only for purposes which directly serve the grantee or are of direct benefit to the Government. Expansion or widening of existing non-corridor easements will generally not be permitted.

Corridor 1

This corridor is approximately 11,700 feet long and includes the existing right-of-way for West Camp Wisdom Road plus an additional 15 feet on both sides of the right-of-way where it crosses or is adjacent to Federal land. Use of this corridor is restricted to installation of underground utilities using directional boring. USACE may waive the boring restriction in areas that are not classified as an Environmentally Sensitive Area. If the right-of-way of West Camp Wisdom Road is widened at a future date, the corridor will be restricted to the width of the new right-of-way.

Corridor 2

This corridor is approximately 25,000 feet long and includes the existing right-of-way for Lakeridge Parkway plus an additional 15 feet on both sides of the right-of-way where it crosses or is adjacent to Federal land. Future use of this corridor is restricted to installation of underground utilities using directional boring. USACE may waive the requirement for boring if circumstances warrant. Use of the corridor at bridge locations may include attaching utility lines to the bridge (if allowed by Texas Department of Transportation (TXDOT) or the City of Grand Prairie), or placement/burial on the lake bottom. The north end of this corridor crosses the west end of Joe Pool Dam. Use of this portion of the corridor will require extensive review by USACE and approval is not guaranteed.

Corridor 3

This corridor is approximately 4,380 feet long and includes the existing right-of-way of Mildred Walker Parkway where it crosses Federal land. Use of this corridor is restricted to underground utilities installed by directional boring. The boring requirement may be waived pending review by USACE and the City of Grand Prairie. If circumstance warrant, utility lines may be attached to the bridge over Lynn Creek (contingent on City of Grand Prairie approval).

Corridor 4

This corridor is approximately 3,900 feet long and includes the existing right-of-way of State Highway 360 on both sides of the highway. Use of this corridor is restricted to underground utilities. The crossing of Walnut Creek must be by subsurface directional boring.

Corridor 5

This corridor is approximately 6,870 feet long and includes the existing right-of-way of FM 661 plus an additional 15 feet on both sides of the right-of-way where it crosses or is adjacent to Federal land. If the right-of-way is expanded in the future, use of the corridor will be restricted to the expanded right-of-way.

Corridor 6

This corridor is approximately 4,930 feet long and includes the right of way of an existing underground pipeline plus an additional 15 feet on either side of the pipeline. Use of the corridor is restricted to underground utilities.

Corridor 7

This corridor is approximately 1,200 feet long and includes the existing 20 feet wide right-of-way of a sewer line that is partly underground and partly above ground. The underground portion and above ground portion of the existing easement are two separate parcels of USACE land. Use of the corridor is restricted to underground utilities.

In summary, the following best management practices shall be applied in the future use of the seven corridors described above:

- Use existing easements before using additional space.
- Efficient use of the designated corridor space to allow the maximum number of utilities possible to occupy the space. Reduced cost is not a reason to occupy more space. A typical drawing depicting how utility lines can be placed efficiently within a corridor is provided in Appendix A following the map of corridor locations.
- In accordance with USACE policy at Chapter 17 of EP 1130-2-550, Non-Recreation Outgrant Policy, avoid placement of utility lines on USACE land unless there is no reasonable alternative route.

- Underground utilities shall be installed by boring at all creek crossings, and where feasible, across the full extent of designated corridors. Bore pits shall be a minimum of 100 feet from the centerline of creeks and, depending on site conditions, may need to be placed farther than 100 feet.
- Overhead electric and communication lines must meet minimum sag height requirements to be specified by USACE.
- Natural resources damaged or destroyed within corridors shall be mitigated per USACE requirements.
- Current and future identified cultural resources will be protected.

6.2 SHORELINE MANAGEMENT POLICY

On December 13, 1974 the USACE published a regulation, ER 1130-2-406, in the Federal Register entitled “Civil Works Projects: Lakeshore Management.” This regulation was published as Part 327.30 of Chapter III, Title 36 of the Code of Federal Regulations. A subsequent change to the regulation was published in the Federal Register on October 31, 1990, incorporating the results of recent legislation and changing the name to “Shoreline Management at Civil Works Projects.” The focus of this regulation is to establish national policy, guidelines, and administrative procedures for management of certain private uses of Federal lands administered by USACE. A key requirement in the regulation is that private shoreline uses, as defined in the regulation, are not allowed at lakes where no such private uses existed as of December 13, 1974. Joe Pool Lake was constructed in the 1980s, thus private shoreline uses are not allowed.

The private uses described in the regulation primarily include privately-owned floating facilities such as floating boat docks, fixed or movable piers, and vegetation modification activities such as plantings, mowing, and selective removal of shrubs and trees to the extent that exclusive benefits accrue to an individual or group and the general public is denied use of public lands or waters. Not included in the above definition are certain limited private activities that do not provide exclusive benefits to an individual or group, nor preclude general public use. These limited private activities may be allowed at Joe Pool Lake by written shoreline use permit for reasons of public safety, erosion control, benefits to wildlife, or to provide reasonable pedestrian access to the shoreline. USACE regulations at ER 1130-2-406 requires the preparation of a Shoreline Management Policy Statement (SMPS) for those lakes that were constructed or became operational after December 13, 1974. In response to this requirement a SMPS was prepared for Joe Pool Lake after the lake became operational in 1986.

In 2012, an administrative update to the Joe Pool Lake Shoreline Management Policy was prepared to incorporate current terminology and to ensure compliance and compatibility with the most current versions of ER 1130-2-406 and ER 1130-2-540, as well as Fort Worth District policy decisions related to shoreline management. One of the primary reasons for the administrative update was to incorporate language that supports the USACE natural resources mission statement to “manage and conserve natural

resources consistent with ecosystem management principles” as set forth in ER 1130-2-540.

The purpose of the SMPS is to set forth the policy and procedures by which USACE manages certain private uses of public lands at Joe Pool Lake. Private uses that accrue exclusive benefits to an individual are not allowed at Joe Pool Lake. The non-exclusive private uses that may be authorized by written permit from USACE include mowing and removal of underbrush to the extent needed for protection from wildfire and limited clearing to provide a pedestrian access path from private property to the shoreline. These non-exclusive uses may not be authorized in all areas and are subject to restrictions set forth in the SMPS. Inquiries regarding the SMPS at Joe Pool Lake should be directed to the USACE office at Joe Pool Lake.

6.3 RECREATIONAL BOATING STUDY

In 2002, the Fort Worth District adopted a policy governing water-related recreation development that has the potential to affect the degree of boating traffic on the water surface of all Fort Worth District lakes. In brief terms, the policy established a target capacity of 22 surface acres of boatable water surface for each vessel on the water during peak use periods. Using the number of boat ramp parking spaces, wet storage slips, and dry stacked storage slips as a basis for calculating potential boating activity, USACE can determine whether a proposed addition of parking spaces or storage slips has the potential to exceed the target capacity. Based on boat counts conducted by the City of Grand Prairie on peak use days in 2012 on Joe Pool Lake, USACE has determined that boating traffic on peak use days has exceeded the target capacity. However, no interviews or stakeholder surveys were conducted in 2012, and that information is a factor in making decisions related to boating capacity. In view of the known high level of boating traffic, USACE would require a comprehensive water-related recreation boating study prior to making a decision to approve or deny a proposal for additional slips or boat ramp parking spaces at Joe Pool Lake. An exception to this requirement is the possible placement of a commercial marina in Cedar Hill State Park to replace a marina that operated for several years in the park, but was removed from the lake in 2017. Adequate funding was not available to conduct a Recreational Boating Study (RBS) during preparation of this Master Plan. If and when funding is available a RBS will be conducted and the findings incorporated into the Master Plan.

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CHAPTER 7 -PUBLIC AND AGENCY COORDINATION

7.1 PUBLIC AND AGENCY COORDINATION OVERVIEW

The USACE is dedicated to serving the public interests in support of the overall development of land uses related to land management for cultural, natural, and recreational resources of Joe Pool Lake. An integral part of this effort is gathering public comment and engaging stakeholders in the process of planning. USACE policy guidance in ER and EP 1130-2-550 requires thorough public involvement and agency coordination throughout the master plan revision process including any associated NEPA process. Public involvement is especially important at Joe Pool Lake to ensure that future management actions are both environmentally sustainable and responsive to public outdoor recreation needs in a region, which is experiencing rapid population growth. The following milestones provide a brief look at the overall process of revising the Joe Pool Lake Master Plan.

The USACE began planning to revise the Joe Pool Lake Master Plan in January of 2015. The objectives for the master plan revision are to (1) update land classifications to reflect changes in USACE land management policies since 1981, prepare new resource objectives, and revise the Master Plan to reflect new agency requirements for master plan documents in accordance with ER 1130-2-550, Change 7, January 30, 2013 and EP 1130-2-550, Change 5, January 30, 2013.

- May 2015 – USACE submits budget package to initiate a Master Plan revision at Joe Pool Lake in October 2016.
- December 2016 – USACE holds internal meetings to initiate master plan revision process.
- January – May 2017 – USACE gathers preliminary information to initiate revision.
- 23 May 2017 - Initial public scoping meeting held in Grand Prairie to announce initiation of the revision process and to request public input.
- June – October 2017 – Public comments considered and preparation of draft MP initiated.
- 2-6 October 2017 – USACE, TPWD, and USFWS conduct wildlife habitat evaluation field work on Joe Pool Lake project lands.
- November 2017 – January 2018 – USACE conducts workshops with City of Grand Prairie and TPWD to discuss land classifications and future development plans.
- February – June 2018 – Work continues on draft MP. Lake Manager and planning staff continue meeting with key stakeholders to personally inform them of the master plan process.
- July 2018 – Public meeting scheduled to announce the final draft MP.

7.2 INITIAL STAKEHOLDER AND PUBLIC MEETINGS

The first action was a scheduled public scoping meeting providing an avenue for public and agency stakeholders to ask questions and provide comments. The public scoping meeting was held on 23 May 2017 at the Summit Activity Center, 2975 Esplanade, Grand Prairie, TX 75052. The Fort Worth District placed advertisements on the USACE webpage, social media, and print publications two weeks prior to the public scoping meeting.

Photo 7.1 Joe Pool Lake Master Plan Public Scoping Meeting – May 23, 2017



USACE employees hosted the meeting, which was conducted in an open format. Participants were asked to sign in at a table where staff provided the participants with information regarding the structure of the scoping meeting and comment forms. After signing in, participants were directed to be seated in the auditorium and a slide presentation was presented by the Project Manager for the Master Plan Revision Project Delivery Team (PDT) to convey information about the following topics:

- Public Involvement Process
- Project Overview
- Overview of the NEPA process
- Master Plan and current land classifications
- How to Submit Comments

At the conclusion of the presentation USACE representatives were available to answer questions and receive written comments at information tables. Interested

persons had the opportunity to comment about the project using a variety of methods, including the following:

- Filling out a comment form at the open house
- Taking a comment form home to be returned at a later date
- Submitting a comment using electronic mail
- Submitting a comment and mailing it in on letterhead or choice of paper

In total, approximately 54 individuals, not including USACE personnel, attended the 23 May 2017 public scoping meeting for elected officials, the public at large, interest groups, partner agencies, other government agencies, and businesses. Among the attendees were U.S. and State representatives, TPWD, city of Grand Prairie, city of Cedar Hill, city of Mansfield, city of Midlothian, Dallas County, Dallas Off Road Bicycle Association, and numerous citizens. A total of 6 written comments were received following this public scoping meeting. Much like national forests or parks, Joe Pool Lake is a Federally-owned and managed public property. It is USACE goal to be a good neighbor as well as steward of the public interest as it concerns Joe Pool Lake. As such, USACE is bound to the equal enforcement of policies and rules for this publically held national asset. Table 7.1 gives a summary list of the comments received during and following the initial scoping comment period for the master plan, as well as the USACE response.

Table 7.1 Public Comments from 23 May 2017 Public Scoping Meeting

COMMENT	USACE RESPONSE
Comments from Texas Parks and Wildlife Department	
TPWD recommended referring to the Texas Conservation Action Plan - Texas Blackland Prairies Ecoregion (TCAP) as well as the RTEST and TXNDD websites for listings of sensitive species that may occur on USACE lands at Joe Pool Lake.	Agree. The TCAP, TXNDD and the Ecological Mapping System, all developed and maintained by TPWD were used extensively in preparing the Master Plan and accompanying EA. Lists of Species of Greatest Conservation Need (SGCN) are provided in Appendix C of the Master Plan.
TPWD recommended the MP include natural resources inventories and monitoring goals to identify habitat changes over time.	Agree. USACE has completed a very basic inventory of vegetation at Joe Pool Lake to guide future management. Additionally, preparation of the Master Plan revision included completion of a Wildlife Habitat Evaluation using the Wildlife Habitat Appraisal Procedure (WHAP) developed by TPWD. The

COMMENT	USACE RESPONSE
	results of the WHAP was used in land classification decision making and future management direction.
TPWD recommended incorporation of pollinator conservation into the Master Plan.	Agree. USACE has included a natural resources management objective in Chapter 3 directing that special attention be given to butterfly and pollinator habitat. Additionally, USACE, TPWD and the City of Grand Prairie have collaborated to designate key wildlife habitat as Environmentally Sensitive Areas, and Multiple Resource Management Lands that place emphasis on Wildlife and Vegetative Management on USACE lands that are leased to TPWD (Cedar Hill State Park) and the City of Grand Prairie.
TPWD recommended USACE should identify if there is a need for additional boat ramps or if the lake already meets a maximum safe boating use capacity.	Agree. USACE has a Water Related Recreation Development Policy that is intended to balance the level of boating traffic with acres of boatable water on peak use recreational days. As stated in the Master Plan, a 2012 boat count at Joe Pool Lake indicated a level of boating traffic that may be unsafe or that prevents an enjoyable boating experience. USACE hopes to conduct a comprehensive recreational boating survey in 2019 to confirm the level of boating traffic and gauge public opinion. Until that survey is completed, no additional boat ramps or boat ramp parking spaces will be permitted at Joe Pool Lake. Additionally, no new wet slips beyond the number that has been previously authorized at marinas will be permitted.

COMMENT	USACE RESPONSE
<p>TPWD recommends that USACE take an active role in working with the marina to ensure the inspection of incoming boats to prevent the introduction of zebra mussels in Joe Pool Lake.</p>	<p>USACE is actively engaged in providing educational materials to marina operators with the goal of preventing unintended introduction of zebra mussels. TPWD Inland Fisheries Department is also very active in providing educational materials and conducting periodic boat inspections at boat ramps throughout the state in areas where introduction of zebra mussels is a probability. In general, marina operators in Texas are well aware of the threat posed by zebra mussels and are doing their part to prevent introduction.</p>
<p align="center">Comments from the City of Grand Prairie</p>	
<p>The City of Grand Prairie recommended that all seven parcels of USACE land that the city leases for park and recreation purposes be reclassified as High Density Recreation with the exception of several parcels of key wildlife habitat that should be classified as Environmentally Sensitive Areas, or for Wildlife Management.</p>	<p>Agree. USACE and Grand Prairie met and communicated over a period of several months to reach consensus on the classification of USACE lands that are included in the city's lease. USACE is confident that the final classifications meet both recreational needs and environmental stewardship objectives.</p>
<p>The City proposed a land classification "swap" to include changing some Wildlife Management lands adjacent to Estes Park to High Density Recreation and at the same time change some High Density Recreation land in Britton Park to Wildlife Management.</p>	<p>Agree. The land classification "swap" will benefit both the recreation and the environmental stewardship management objectives at Joe Pool Lake.</p>
<p>The City noted that if a second marina is proposed at Joe Pool Lake, the city wants to be involved in the process.</p>	<p>Agreed. The Joe Pool Lake Marina was removed from the lake in 2017. The marina operated under a sublease agreement with TPWD in Cedar Hill State Park. TPWD has no immediate plans to replace the marina but has requested to retain authority to replace the marina at a future date within the state park.</p>

COMMENT	USACE RESPONSE
Comments from the Public at Large	
Protect remaining natural areas and greenspace. No resort, no more zoning for homes or commercial development. Grow existing natural areas to compliment environmental needs.	Agree in part. The reclassification of USACE lands resulted in designation of 1,507 acres of Environmentally Sensitive Areas at several locations throughout the project. One of the largest contiguous areas is part of Loyd Park and takes in the bottomland forests on both sides of Walnut Creek. Other ESAs are intended to protect riparian corridors with high wildlife habitat value. The original master plan called for development of a lakeside resort in Estes Park. The park is leased to Grand Prairie and the city is seeking proposals to develop a portion of the park into a comprehensive resort. The city's own Lake Parks master plan dated 2016 calls for a mix of development, promotion of trails, and protection of natural areas.
We use the road across the dam for hiking and biking and are concerned about the safety hazard posed by cracks in the road surface.	The road across the dam is primarily a service road for dam access and maintenance. Currently the road is closed to public access due to a combination of cracks in the road surface and minor slides that have occurred in the dam itself. When repair of the slides and cracks is complete, USACE will evaluate continued public access to the road.
Repair of 2015 flood damage in Cedar Hill State Park should be partly funded by USACE.	In accordance with the lease agreement between USACE and TPWD, all maintenance and repair of facilities in Cedar Hill State Park is the responsibility of TPWD.
USACE should pursue a direct lease with a new marina/restaurant in Cedar Hill State Park in order to allow the marina/restaurant to sell alcoholic beverages. TPWD does not allow the sale of alcoholic beverages within state parks and no restaurant or marina will	USACE has no plans to pursue a direct lease for a marina/restaurant at Joe Pool Lake. TPWD may pursue such a lease in the future and it is true that they do not allow the sale of alcoholic beverages within the state park.

COMMENT	USACE RESPONSE
survive financially unless allowed to sell alcohol.	

7.3 PUBLIC AND AGENCY REVIEW OF DRAFT MP, EA, AND FONSI

Note: This section to be completed following the final public meeting.

The final draft Master Plan and Environmental Assessment was made available for public and agency review online beginning 20 July 2018, then was presented at a public meeting held on 31 July 2018 at the Summit Activity Center, 2975 Esplanade, Grand Prairie, TX 75052. A total of 60 individuals, not counting USACE staff attended the 31 July 2018 meeting. During the 30-day comment period following the meeting, a total of 10 individuals and 2 government agencies provided written comments. The comments and government response are provided in Table 7.2.

Table 7.2 - Public Comments from 31 July 2018 Public Meeting to Announce the Final Draft of the Joe Pool Lake Master Plan

COMMENT	USACE RESPONSE
COMMENTS FROM ENVIRONMENTAL PROTECTION AGENCY (EPA)	
The EPA completed its review of the Draft EA/FONSI which describes environmental impacts associated with the Joe Pool Lake Master Plan and had no objections.	Noted
COMMENTS FROM TEXAS PARKS & WILDLIFE DEPARTMENT	
Based on TPWD State Parks Division review, the Plan appropriately classifies the lands within Cedar Hill State Park	Noted.
Because there are sensitive resources within HDR sites that are not given an ESA or MRML land classification, TPWD recommends that future development within HDR areas include an assessment of environmental impacts on a project-specific basis to be coordinated for TPWD review. TPWD recommends that future development follows a limited-footprint design that avoids, minimizes, or mitigates impacts to sensitive resources.	Concur.
TPWD recommends that future development considers the potential impacts that structure height and lighting may have on view-sheds from the lake and on migrating birds.	Concur.

COMMENT	USACE RESPONSE
TPWD recommends avoiding or minimizing the removal of shoreline vegetation that provides a visual screen between development and lake users and protects the shoreline from erosion.	Concur
TPWD recommends that future development retains forest corridors to accommodate wildlife and passive use trails, such as the trail to circumnavigate the lake that USACE, TPWD, and Grand Prairie have expressed a common interest in pursuing.	Concur. Trails, including a trail that would circumnavigate the lake is discussed in Section 5.8 of the Plan.
TPWD recommends that future development incorporates native landscaping that is drought tolerant and provides floral resources for pollinators.	Concur.
TPWD recommends that the Plan identify the areas on Cedar Hill SP used for TXDOT and City of Cedar Hill mitigation for impacts to Joe Pool Lake fee simple lands as a result of highway development.	Concur. All areas in Cedar Hill SP where the mitigation work took place has been included in either a MRML – Vegetation Management, or an ESA land classification.
TPWD recommends utilizing the notations of Table 8.1 in Table ES.I and correcting Table ES.I and Table 8.1 to reflect the land classifications appropriately. Because the values (acres) of Separable Recreation Lands is already included in the land classification acres, then TPWD recommends no value for Separable Recreation Lands be placed in the column of acres of land classifications, since it isn't actually a land classification.	Concur. Tables will be adjusted as recommended.
TPWD noted 5 minor errors or omissions in Chapter 2 including an incorrect Table number, incorrect listing of an endangered species, the need to list the bald eagle as a state-listed threatened species, and the need to clarify which invasive species are known to occur in Joe Pool Lake.	Each item noted will be corrected and/or added.
TPWD recommends depicting named streams on the east side of the lake on the maps for Utility Corridors and Park Development Status in Appendix A and	Concur with the request to include the named streams on the maps. The location of Corridor 7 is incorrectly shown on the draft Corridor Map.

COMMENT	USACE RESPONSE
<p>confirming that the location of Utility Corridor 7 is appropriate to avoid potential impacts of future utility development on Hollings Branch and associated habitats.</p>	<p>Corridor 7 is limited to the existing right-of way of the existing sewer line operated by the City of Grand Prairie. The length of the existing right-of-way is approximately 900 feet and while it does run through the ESA, it is not located within the Hollings Branch riparian habitat.</p>
<p>If Specific Recreation Lands represent the lands allocated as Separable Recreation Lands, then TPWD recommends that the map sheets depict a separate heading for Allocation Lands which identify Separable Recreation Lands using the terminology of the Plan narrative.</p>	<p>The term “Specific Recreation Lands” is erroneous and will be changed on each map to “Separable Recreation Lands” under a heading of “Land Allocation”.</p>
<p>PUBLIC COMMENTS</p>	
<p>LAND CLASSIFICATION (6 Comments)</p>	
<p>The High Density Recreation land classification seems inappropriate for the area of Cedar Hill State Park where the park adjoins the Cedar Mountain Nature Preserve operated by the City of Cedar Hill.</p>	<p>Disagree. All changes to the land classifications within Cedar Hill State Park (CHSP) were decided by TPWD staff. In TPWD’s 2015 statewide Land and Water Resources Conservation and Recreation Plan, it is clearly stated that TPWD will be “an exemplary steward of the public’s lands and waters by using the best available science for ecosystem-based management.” USACE is confident that TPWD’s management of Cedar Hill State Park will be compatible with the management of the adjoining Cedar Mountain Nature Preserve under the HDR classification. USACE policy supports recreation development that compliments and is dependent on water-oriented and natural resource based recreation. No amusement parks or similar developments would be permitted.</p>
<p>The lease of the peninsula to GP designated as Estes Park should be terminated and the land allowed to remain in its undisturbed state.</p>	<p>Nonconcur. USACE has no intention of terminating the lease with Grand Prairie. The City of Grand Prairie provides essential outdoor recreation</p>

COMMENT	USACE RESPONSE
	<p>opportunities over a large area at Joe Pool Lake. Estes Park, since publication of the 1981 Master Plan, has been envisioned by USACE as an appropriate location for a comprehensive resort in accordance with past approved actions and USACE policy. The Trinity River Authority (TRA) in 1999, followed by Grand Prairie in 2002, requested proposals for development of a resort in Estes Park. The 1999 TRA solicitation was addressed by USACE in an Environmental Assessment (EA) and the 2002 Grand Prairie solicitation was addressed in a supplement to the 1999 EA. Neither request resulted in action. As noted in Chapter 5 of the draft Master Plan, the City of Grand Prairie is again soliciting proposals for development of a comprehensive resort on Estes Peninsula. The solicitation is very similar to the 2002 solicitation and dictates that most, if not all, of Estes Park be classified for High Density Recreation. The degree of development that may be included in a proposal is uncertain and is therefore not described in the draft Master Plan. If the solicitation results in a proposal, USACE will address the proposal in a second supplement to the 1999 EA, or a separate EA complete with a public comment period. It is noteworthy that USACE recreation development guidelines specify that permanent concession buildings at Joe Pool Lake should be located above elevation 536.0 NGVD. This requirement is flexible, but must be respected to the maximum extent possible to prevent unnecessary damage to buildings from inundation. A comparatively small portion of Estes Park lies above the 536.0 contour so the</p>

COMMENT	USACE RESPONSE
	<p>majority of buildings that may be included in any proposal would need to be located on the higher ground leaving the lower lying areas for much less intense development. The current solicitation by Grand Prairie specifies that the portion of Estes Park lying west of Lakeridge Parkway would be an ideal location for a nature center and trail. In light of that, and in response to public interest, Grand Prairie has asked that approximately 100 acres of this 110 acre portion of Estes Park be reclassified as Multiple Resource Management Lands - Low Density Recreation.</p>
<p>Fish and Wildlife Sanctuary areas must be provided.</p>	<p>Disagree. USACE defines Fish and Wildlife Sanctuary as areas where annual or seasonal restrictions are needed on areas to protect fish and wildlife species during periods of migration, feeding, nesting and/or spawning. These areas are primarily water surface areas but may also include land areas. Such areas are not needed at Joe Pool Lake because USACE does not allow hunting on land or water areas at the lake and more than 4,000 acres have been included in land classifications that maintains the land in a natural state. All of this acreage, as well as the long-standing no hunting restriction, provides substantial benefit to fish and wildlife populations.</p>
<p>Environmentally Sensitive Areas (ESA) are isolated from each other and should be connected by corridors of habitat to have maximum value for wildlife</p>	<p>Disagree. The ESAs at Joe Pool Lake were selected primarily to provide long term protection of sensitive wildlife habitat, native vegetation or cultural resources. While the definition of an ESA in USACE regulations (EP 1130-2-550, Chapter 3) does not specifically include wildlife travel corridors, the ESAs, and most shorelines outside of mowed recreation areas do serve as</p>

COMMENT	USACE RESPONSE
	<p>corridors for small mammals and amphibians. As such, these areas are not completely isolated tracts of land. ESA's as well as other USACE lands, also provide significant nesting and feeding areas for migratory songbirds especially within the Dallas-Fort Worth metropolitan area where multiple USACE lakes provide a major percentage of undeveloped lands.</p>
<p>In the new draft of changes from 1981 to 2018 the high use/high density recreation area has been increased by 903 acres (4139-3236) (see Table ES.1). <u>This is especially worrisome.</u></p>	<p>Disagree. The 1981 Master Plan classified 3,236 acres as Recreation – High Use with an additional 1,756 acres classified as Recreation High Use / Interim Wildlife. The plan called for these “Interim Wildlife” areas to eventually become Recreation –High Use areas resulting in 4,992 acres of land classified to ultimately become Recreation – High Use. The 2018 draft actually reduces this Recreation – High Use acreage from 4,992 acres to 4,139 acres.</p>
<p>There are FOUR possible categories of allocation identified in USACE regulations in accordance with the authorized purpose for which the project lands were acquired:</p> <ul style="list-style-type: none"> -Operations -Recreation -Fish and Wildlife -Mitigation <p><u>Question: Why does the allocation omit Fish and Wildlife and mitigation?</u></p>	<p>USACE regulations (EP 1130-2-550, Chapter 3), USACE defines “land allocation” as the designation of land areas based on the purpose for which Congress authorized the land to be acquired. No lands were authorized for acquisition at Joe Pool Lake for the specific purpose of Fish and Wildlife or Mitigation. At Joe Pool Lake, USACE acquired 15,067 acres of which 13,592 acres were acquired for Operations and 1,475 acres were acquired specifically for Recreation.</p>
<p>ENVIRONMENTAL QUALITY (6 comments)</p>	
<p>Concerned about increased water pollution from development of High Density Recreation areas and hydraulic fracturing associated with oil and gas exploration</p>	<p>High Density Recreation (HDR) Areas are, by comparison to typical residential or commercial properties, only lightly developed. All HDR areas have substantial grassland and woodland areas that act as stormwater filters. This, combined with environmental</p>

COMMENT	USACE RESPONSE
	<p>compliance inspections conducted by USACE in all developed areas will serve to reduce on-site water pollution to negligible levels. Water quality issues that may be associated with oil and gas exploration are monitored by the Texas Railroad Commission and Texas Commission on Environmental Quality. As noted in Section 2.2.8 of the Master Plan, during land acquisition at Joe Pool Lake, the mineral estate was subordinated to the extent that surface locations for wells are not allowed on Federally-owned lands at Joe Pool Lake. USACE has granted no waivers of this subordination.</p>
<p>Why have no sediment surveys been done to determine the amount of sediment accumulation in the lake?</p>	<p>In general, funding for a new sediment survey at Joe Pool is a low priority when compared to other needs within USACE operational budgets. The Trinity River Authority (TRA) could partner with USACE to conduct a sediment survey, but until demand for water from Joe Pool Lake increases, making it more important to know the impact from sediment accumulation, it is unlikely that TRA would want to proceed with a survey.</p>
<p>The Wildlife Habitat Appraisal Procedure (WHAP) developed by TPWD is inadequate to accurately measure the diversity of flora and fauna around Joe Pool Lake.</p>	<p>Disagree. The WHAP procedure was selected because the budget and schedule for the master plan revision called for use of a habitat evaluation methodology that could be deployed quickly and efficiently. The WHAP answered that need. The Wildlife Habitat Appraisal Procedure was developed to allow a qualitative, holistic evaluation of wildlife habitat for particular tracts of land statewide without imposing significant time requirements in regard to field work and compilation of data. The WHAP provides USACE with valuable,</p>

COMMENT	USACE RESPONSE
	appropriate-level information with which to classify land uses.
Developing HDR areas would lead to an increased number of boats with an attendant increase in air pollution. How will this be mitigated?	Disagree. With the exception of the possibility of TPWD placing a marina in Cedar Hill State Park to replace a previous marina, USACE policy currently will not allow an expansion of marina wet slips or boat ramp parking spaces at Joe Pool Lake pending completion of a comprehensive Recreational Boating Survey (RBS). Further, completion of a RBS may or may not result in a decision that allows more slips or boat ramp parking depending on the results of the survey.
To declare that development of HDR areas will not adversely affect threatened or endangered species is folly. An Environmental Impact Study (Statement) is required!	Disagree. Coordination with the USFWS and TPWD determined that the overall reclassification of lands at Joe Pool Lake would have a net long term beneficial impact on natural resources including threatened and endangered species. There are five federally-listed threatened or endangered species listed for Joe Pool Lake. Each of these species are migratory birds considered to have potential to occur or would be a rare occurrence on Federal lands at Joe Pool Lake.
Preserve and safeguard riparian and other tree canopies to maintain wild space/habitat as well as mitigating greenhouse gas progression and climate change persistence and effects.	Concur. The ESA classifications and associated management plans will protect and expand riparian and other tree canopies.
RECREATION DEVELOPMENT (8 comments)	
Any large resort on Estes Peninsula will bring extreme traffic congestion, placing even more burden on the Cities to expand roadways, bridges, and paved recreation trails to reduce dangerous bicycle traffic directly on the roadways. The Plan needs	Concur. The City of Grand Prairie would be responsible for ensuring that public services, including roadways, are adequate to service any development in Estes Park. The term “comprehensive resort” is defined in USACE regulations in Chapter 16 of ER 1130-2-550 as

COMMENT	USACE RESPONSE
<p>to establish guidelines concerning the size and scope of a “comprehensive resort.”</p>	<p>follows: <i>Typically multifaceted developments with facilities such as marinas, lodging, conference centers, golf course, tennis courts, restaurants and other similar facilities.</i> Additionally, EP 1130-2-550 states that recreation development in general shall be at an “appropriate scale” and shall “be in harmony with the surrounding environment.” As noted in other responses, a marina would not be allowed in Estes Park pending completion of a Recreational Boating Survey at Joe Pool Lake.</p>
<p>I support and agree that an area similar to Loyd Park with campgrounds, cabins, lodge or lodges, boat ramp, small store, even a gas station...will be a needed expansion in the future</p>	<p>Concur with the exception that a gas station would not be allowed as part of any future expansion. Future development of recreation facilities is dependent on the non-federal partners at Joe Pool Lake.</p>
<p>I learned at the July 31 meeting that the top of the Dam was recently closed, and that it seems to have closed without communication. I understand the safety aspects with the cracked surface. This needs to be repaired quickly, as I personally know quite a few regulars that traverse this on foot and bicycle.</p>	<p>The pedestrian use of the service road on Joe Pool Dam is addressed in Chapter 5 of the Master Plan. Plans call for repairing the road and reopening it to public use, but the Master Plan makes it clear that recreational use of the service road is considered by USACE to be incidental use and subject to termination for security or operational needs. USACE continues to look for better systems of communicating with the public.</p>
<p>I would like to see a connected trail system all the way around the lake. Some areas are making strides towards this. I am not aware if there is an over-arching plan or communication towards a connected trail.</p>	<p>All public entities and some private, non-profit organizations that actively manage lands at Joe Pool Lake support the concept of a trail that circumnavigates the lake. As noted in the Chapter 6 of the Master Plan, USACE supports this concept and will work with trail proponents, but cannot accept direct responsibility for the trail.</p>

COMMENT	USACE RESPONSE
A trail circumnavigating the lake would cause disruption of wildlife habitat and destruction of vegetation.	Disagree. On all lands outside of HDR areas, any future trail would be required to be a natural surface trail open only to pedestrian traffic. No motorized vehicles would be permitted on the trail.
I would prefer no development at Estes Park, leave it natural for wildlife and people. So much of DFW area is developed, we need to save our green and natural areas.	See response to a similar comment above.
Do not allow expansion of land and water oriented recreation. Doing so would increase traffic and noise. Bottom line, if it's not broken, don't break it!	Disagree. USACE lands and recreation opportunities serve many and varied users. Some expansion of recreation development is anticipated and is described in the Master Plan.
This land should not be developed. The land by our house supports wildlife. I sincerely hope the city is not pressuring the Corps to develop this area. I made a vote of confidence in this city with my investment and I hope the city and the Corps will not let me down.	Noted. In 2016, the City of Grand Prairie produced its own parks master plan which address the lake parks as well as many others the city is responsible for. USACE relied on this plan as well as constant communication with city staff members to produce a Master Plan that is responsive to the many and varied recreation needs associated with Joe Pool Lake.
BOATING AND MARINAS (9 comments)	
A second marina on the lake would cause additional congestion on an already overcrowded lake.	Currently, TPWD retains authority to place a marina on Joe Pool Lake that would not exceed the slip numbers of a previous marina that was removed from Cedar Hill State Park in 2015. USACE would allow TPWD to proceed with a new marina, but the decision to do so rests with TPWD.
On Water Buoys – I have noticed a big improvement in the replacement and repair of on water markings since the initial Planning meeting. Thank you for making these improvements. Please continue to improve markings around uncleared (treed) areas.	Noted.

COMMENT	USACE RESPONSE
<p>Moorings – Could approximately three moorings be placed in the primary ‘party cove’? Some of the area has very loose silt making anchoring tough at times, especially when winds change. Several other lakes in the area have these, and it seems to improve the safety aspect of anchoring and tying up. There might also be a need for this near the beaches, and outside campgrounds.</p>	<p>USACE has no plans to place mooring buoys at any location on Joe Pool Lake. USACE is willing to work with lessees who may wish to place mooring buoys along the shoreline near their respective leased areas on the condition that the lessee is responsible for buoy maintenance and use restrictions.</p>
<p>Second Marina – In my thinking, the Cedar Hill side is the rational choice to help spread out boat traffic. Estes Peninsula could be a viable choice, but if it borders the north side of the peninsula, it will be very close to Lynn Creek Marina, and will hurt the recreation that occurs in the lake’s primary sheltered cove, and along the sheltered waters for water skiing/wakeboarding/tubing. The rumor about the State Park opening a second entrance near the bridge on the Cedar Hill side is encouraging. A marina in that area would be easy to get to, very visible from the road to attract visitors, and more likely to do well.</p>	<p>See previous responses concerning a second marina. Under current policy, USACE would not allow a second marina to be placed on Estes Peninsula pending results of a comprehensive Recreational Boating Survey. TPWD currently has no definite plans to open a second entrance into Cedar Hill State Park.</p>
<p>Additional boat slips are needed. The Draft Plan documents safety concerns with the number of boats on prime weekends based on a formula, and calculated in 2012. In 2012, the State Park Marina was still open, and those boat slips were part of the calculation. Today, no marina (in the State Park) exists, and the formula should show a more positive statistic showing a marina is needed.</p>	<p>See previous responses related to a second marina on Joe Pool Lake. USACE agrees, that the boat counts resulting from the 2012 survey could change as the result of numerous factors, with the absence of the state park marina being one factor.</p>
<p>State Park Underwater Object – There is an underwater danger at the State Park, near the boat boarding dock by the primary boat ramp</p>	<p>Noted. This has been reported to TPWD. USACE appreciates being notified of any navigation hazard.</p>

COMMENT	USACE RESPONSE
<p>Boater Education – I observe a lot of behavior that is in basic boater education. I took the Texas Boater Education many years ago. It was simple, common sense material, but I do not believe most people are aware. I see many jet ski activities that are obviously not aware of even basic safety regulations.</p>	<p>Noted. USACE works with TPWD to promote water safety in general, but TPWD has the primary mission of boater education in Texas.</p>
<p>A second marina must have direct access, meaning that it should be able to operate and attract visitors without them having to enter a park first. The marina at the State Park was hindered from the beginning because of access limitations, and working within rules and hours of the overall entity. Lynn Creek Marina was originally established within the Park gates, but was quickly changed as issues surfaced with this arrangement.</p>	<p>Concur.</p>
<p>Concerned about the general management and conditions at Lynn Creek Marina. Competition from a second marina would help the situation</p>	<p>USACE works with Grand Prairie to ensure that all sublessees, such as Lynn Creek Marina are operated in a safe manner that serves a public need.</p>
<p>BETTER COMMUNICATION (2 comments)</p>	
<p>There needs to be a better source of information for this lake. I attended last year's kick off meeting, but I felt like it was fortunate for me to see the notice. After seeing the Draft Plan and learning only a few written comments were received, that reinforced that I should have taken more effort to spread the word. I posted the meeting notice in several places and talked about it as much as I could. I was pleased to see a decent attendance on July 31, and I am making sure that I spread the word to my community, and city officials (Cedar Hill). I am hoping much more written feedback is received this time around. I would like to see some method (Facebook, State Website, Links on Grand Prairie/Cedar Hill/Mansfield/Dallas websites, Oasis Restaurant, Lynn Creek</p>	<p>Concur. USACE is aware of the difficulty in contacting the diverse group of visitors that utilize Joe Pool Lake. In addition to providing a news release to major area media outlets, USACE contacted each city bordering or near the lake including Grand Prairie, Cedar Hill, Mansfield, Arlington and Duncanville to inquire of our news release could be posted on each city's social media website. Each city was very enthusiastic in their response to this request. In spite of that success, USACE is eager to hear of other ways to better inform Joe Pool Lake visitors. USACE does have a website where general information is posted about Joe Pool Lake. Likewise, TPWD and Grand Prairie each have websites with much</p>

COMMENT	USACE RESPONSE
<p>Marina, bill boards within some of the park entrances...), a page on the fancy Lynn Creek/Grand Prairie digital sign that help to communicate with the public. Joe Pool Lake probably needs to stand up its own website similar to other lakes/areas. The community is definitely growing, and the lake is busy with interested and supportive people.</p>	<p>lake-related information. The sign mentioned in the comment is maintained by Grand Prairie and is an excellent means of providing information. A single website dedicated to Joe Pool Lake topics is a good idea and USACE would favor such a website as long as posted information is properly vetted and accurate.</p>
<p>GENERAL CONCERNS (1 comment)</p>	
<p>Numerous concerns were expressed about population growth around the lake affecting roadway congestion and the need for public roadway and bridge expansion as well as better safety for bicycles and pedestrians.</p>	<p>Noted. USACE has no authority to influence or manage population growth outside of the Federal fee boundary that might affect roadway congestion and the associated issues of bicycle and pedestrian safety.</p>

Copies of letters received from governmental entities are included in the EA. Upon incorporation of public comment into the draft Master Plan, EA and FONSI, final versions were prepared and signed by the District Engineer for implementation. The final version is posted on the District website.

CHAPTER 8 -SUMMARY OF RECOMMENDATIONS

8.1 SUMMARY OVERVIEW

The preparation of the Joe Pool Lake Master Plan followed the new USACE master planning guidance in ER 1130-2-550 and EP 1130-2-550, both dated 13 January 2013. Three major requirements set forth in the new guidance include (1) the preparation of contemporary Resource Objectives, (2) Classification of project lands using the newly approved classification standards, and (3) the preparation of a Resource Plan describing in broad terms how the land in each of the land classifications will be managed into the foreseeable future. Additional important requirements include rigorous public involvement throughout the process, and consideration of regional recreation and natural resource management priorities identified by other federal, state, and municipal authorities. The study team endeavored to follow this guidance to prepare a master plan that will provide for enhanced recreational opportunities for the public, improve environmental quality, and foster a management philosophy that promotes partnerships and the success of each stakeholder involved in the management of the lands and surface waters of Joe Pool Lake. Factors considered in the Plan were identified through public involvement and review of statewide planning documents including TPWD's 2018 and 2012 TORP (synonymous with SCORP) and the TCAP – Texas Blackland Prairies Ecoregion. Also reviewed was the 2016 Parks, Recreation, and Open Space Master Plan prepared by the City of Grand Prairie for their city parks system which includes the Lake Parks leased from USACE at Joe Pool Lake. This Master Plan will ensure the long-term sustainability of the outdoor recreation program and natural resources associated with Joe Pool Lake.

8.2 LAND CLASSIFICATION PROPOSALS

A key component in preparing this Master Plan was examining prior land classifications and addressing the needed transition to the new land classification standards. During the public involvement process USACE sought public input into whether, besides the simple change in nomenclature, a shift in land classification was desired (for example, should lands with a recreation classification be reclassified to a wildlife classification or vice versa.). Chapter 7 of the Plan describes the public input process.

A total of 6 written comments were received following the 23 May 2017 public scoping meeting. Following the 31 July 2018 meeting, ten individuals and two agencies provided numerous comments. Several comments specifically addressed land classification. Additional comments and recommendations concerning land classification were obtained from TPWD and the City of Grand Prairie following workshops with these entities in January 2018 and Dec 2017, respectively. The input from the public, TPWD, and City of Grand Prairie, as well as information in the TORP and TCAP described in Section 8.1 was used by the planning team to prepare a land reclassification proposal for Joe Pool Lake. All changes reflect historic and projected public use and new guidance

from ER 1130-2-550 and EP 1130-2-550. A summary of acreage changes from prior land classifications to the current classifications is provided in Table 8.1, and key decision points in the reclassification of project lands are presented in Table 8.2.

Table 8.1 - Change from Prior Land Classification to New Land Classification¹

Prior Land Classifications (1981)	Acres	New Land Classifications	Acres
Project Operations	309	Project Operations	308
Recreation – High Use	3,236	High Density Recreation	4,043
Recreation – High Use/Interim Wildlife ²	1,756		
		Environmentally Sensitive Areas	1,507
Recreation/Wildlife Management – Low Use	3,360	Multiple Resource Management - Low Density Recreation	578
		Multiple Resource Management – Vegetative Management	157
		Multiple Resource Management – Wildlife Management	2,070
Permanent pool	7,470 ³	Permanent pool	6,707 ³
Total	16,131¹	Total	15,370¹
Flowage Easement	1,904	Flowage Easement	1,904

¹The new land classification acreage figures were measured using GIS technology and may vary slightly from prior classifications, and from official land acquisition records. Also, with the exception of the Project Operations classification, there is no direct relationship between the prior land classifications and the new land classifications. The USACE planning team considered the prior classifications “Recreation – High Use”, and “Recreation – High Use/Interim Wildlife”, to be equivalent to the current classification “High Density Recreation”. The prior classification of “Recreation/Wildlife Management – Low Use” was considered equivalent to one or more of the current sub-classifications under Multiple Resource Management Lands.

²Included within the acreages of Recreation High Use and Recreation High Use/Interim is 1475 acres of Separable Recreation Lands that were acquired for the sole purpose of Recreation and are not required for Flood Risk Management or Water Conservation purposes.

³The 7,470 acre figure has been used as the conservation pool acreage for many years, but more refined measurements performed as part of the revision of the 1981 Master Plan indicates the conservation pool is 6,707 acres.

Table 8.2 Reclassification Proposals

Proposal	Description	Justification
<p>Project Operations (PO)</p>	<p>Lands classified as PO lands were reclassified as follows:</p> <ul style="list-style-type: none"> ○ 7 acres surrounding the uncontrolled spillway was changed from Recreation – High Use to Project Operations ○ 10 acres of Project Operations land was changed to ESA. 	<p>The 7 acre change recognizes that the uncontrolled spillway is a major operational facility and must be classified as Project Operations. Recreational fishing at the uncontrolled spillway is an incidental use subservient to the primary purpose of the spillway. The 10 acres west of the gate control tower was changed to ESA to recognize important cultural resources.</p>
<p>High Density Recreation (HDR)</p>	<p>Most lands under the prior classifications of Recreation – High Use and Recreation – High Use/Interim Wildlife were converted to the new and similar classification of High Density Recreation, but were reduced from 4,992 acres to 4,043 acres through the following reclassifications:</p> <ul style="list-style-type: none"> ○ 7 acres at uncontrolled spillway changed to PO ○ 291 acres in Loyd Park and 512 acres of CHSP changed to ESA ○ 157 acres changed from Recreation – 	<p>Each of these changes were needed to recognize the following project operational needs:</p> <ul style="list-style-type: none"> ○ 7 acres changed to PO at uncontrolled spillway ○ 1,021 acres change to ESA to recognize high habitat values, important vegetation values, and cultural resource values ○ 275 acres changed to HDR to meet anticipated recreation needs in

Proposal	Description	Justification
	<p>High Use to Vegetative Management in CHSP</p> <ul style="list-style-type: none"> ○ 87 acres of Britton Park changed to MRML-WM ○ 69 acres of Pleasant Valley Park changed to ESA ○ 96 acres of Recreation – High Use/Interim Wildlife in Estes Park changed to MRML-LDR ○ 275 acres of Recreation/Wildlife Management – Low Use changed to HDR (area to be added to Estes Park (177-acres) and HDR portion of Camp Wisdom Park (98-acres)) ○ 5 acres of west portion of Lynn Creek Park changed to ESA 	<p>Estes and Camp Wisdom parks</p> <p>These classification changes will have little to no effect on current or future public use.</p>
<p>Environmentally Sensitive Areas (ESA)</p>	<p>The classification of 1,507 acres as Environmentally Sensitive Areas resulted from the following land classification changes:</p> <ul style="list-style-type: none"> ○ 291 acres of Loyd Park and 512 acres of CHSP from Recreation – High Use to ESA. ○ 10 acres of PO lands to ESA ○ 620 acres of Recreation/Wildlife Management – Low Use to ESA 	<p>These classification changes were necessary to recognize those areas at the project having the highest ecological value, areas serving as filters for surface water runoff, and areas having high cultural resource values. Reclassification to ESA status will have little to no effect on current or projected public use. Lands classified as ESA are given the highest order of protection among possible land</p>

Proposal	Description	Justification
	<ul style="list-style-type: none"> ○ 69 acres of Recreation – High Use / Interim Wildlife (Pleasant Valley Park) to ESA ○ 5 acres of Recreation – High Use / Interim Wildlife (west end of Lyn Creek Park) to ESA 	<p>classifications. These classification changes will have little to no effect on current or future public use.</p>
<p>MRML – Low Density Recreation (LDR)</p>	<p>Approximately 482 acres of former Recreation / Wildlife Management – Low Use was reclassified as MRML – Low Density Recreation. The parcels that were changed included a 91 acre portion of undeveloped Camp Wisdom Park and five distinct additional parcels consisting primarily of narrow shoreline parcels located immediately adjacent to private property. Additionally, 96 acres of former Recreation – High Use/Interim Wildlife land in Estes Park was reclassified as MRML – Low Density Recreation</p>	<p>This classification change of 482 acres was primarily a change in nomenclature from old to new. The 96 acre change was partly in response to public comment and partly to the City of Grand Prairie’s future plans for the 96 acres. Considering the configuration of the parcels in question, as well as their historic and anticipated use, the MRML – LDR classification is the most appropriate. If a nature trail is eventually placed on the 96 acres as envisioned by Grand Prairie, and the area is managed as a controlled access park, passive use of the area by neighboring landowners may be curtailed.</p>
<p>MRML – Vegetative Management (VM)</p>	<p>Approximately 157 acres of former Recreation – High Use lands was reclassified to MRML - VM</p>	<p>This reclassification involves several distinct parcels in Cedar Hill State Park where TPWD is restoring native blackland prairie habitat.</p>
<p>MRML – Wildlife Management (WM)</p>	<ul style="list-style-type: none"> ○ The 2,070 acres of MRML – WM land resulted from a 	<p>The 87-acre undeveloped northern portion of Britton Park</p>

Proposal	Description	Justification
	<p>simple name change on 1,983 acres of former Recreation / Wildlife Management – Low Use as well as the following classification changes: 87 acres of Recreation – High Use / Interim Wildlife (north end of Britton Park) changed to MRML-WM</p> <ul style="list-style-type: none"> ○ 10 acres of Recreation / Wildlife – Low Use was changed to ESA along the west end of the Lynn Creek riparian corridor ○ 482 acres of Recreation / Wildlife Management – Low Use changed to LDR ○ 114 acres of Recreation / Wildlife Management – Low Use changed to ESA (area parallel to toe of dam) ○ 289 acres of Recreation / Wildlife Management – Low Use changed to ESA (along Walnut Creek) ○ 120 acres of Recreation / Wildlife Management – Low Use changed to ESA (Low Branch riparian corridor) 	<p>was reclassified to MRML – WM. Ten acres of riparian corridor on the west end of Lynn Creek was reclassified as ESA. The 482 acre change to MRML - LDR was needed as explained above under the MRML-LDR classification. The 114 acres change to ESA is a parcel parallel to the western downstream toe of the dam that is needed as a visual buffer and is used for mitigation plantings. The 275 acre change to HDR was needed to properly classify Camp Wisdom Park and to make a logical addition of 177 acres to Estes Park. The 87-acre parcel below Joe Pool dam is a riparian corridor along the outlet channel. These classification changes will have little to no effect on current or future public use.</p>

Proposal	Description	Justification
	<ul style="list-style-type: none"> ○ 275 acres of Recreation / Wildlife Management – Low Use changed to HDR (98 acres added to Camp Wisdom Park and 177 acres added to Estes Park) ○ 87 acres of Recreation / Wildlife Management – Low Use Changed to ESA (along Mountain Creek below dam) 	
Water Surface	<p>The classification of 6,707 acres of water surface of the lake at the conservation pool elevation is as follows:</p> <ul style="list-style-type: none"> • 24 acres of Restricted water surface at Joe Pool Lake include the water surface in front of the intake structure at the control tower at Joe Pool Dam and designated swimming areas in Lynn Creek Park and CHSP. Buoys mark the line in front of the dam. Keep-out buoys and floating barrier pipes mark the designated swimming areas in each park. • 103 acres of Designated No-Wake areas are in place near the 7 boat ramps, along Lakeridge Parkway bridges, and at the marina. 	<p>Restricted and Designated No-Wake areas are necessary for public safety reasons. The Water Use Plan in the 1981 Master Plan designated the upper, portions of the Mountain Creek and Walnut Creek arms of the lake as a “Low Speed Boating Area”, but these area are now included in the Open Recreation classification. It is incumbent on boaters to operate their vessel safely in these uncleared areas. The classification of water surfaces will have no effect on current or projected public use.</p>

Proposal	Description	Justification
	There are 6,580 acres of Open Recreation water surface at Joe Pool Lake.	

Note: The land classification changes described in this table are the result of changes to 26 individual parcels of land ranging from a few acres to more than 100 hundred acres. Acreages were measured using GIS technology. The acreage numbers provided are approximate.

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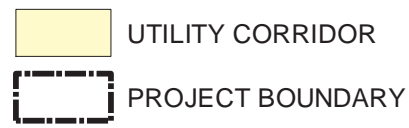
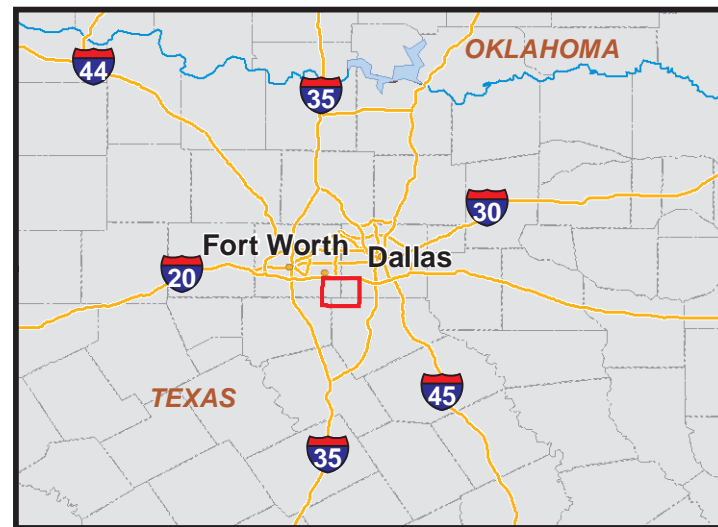
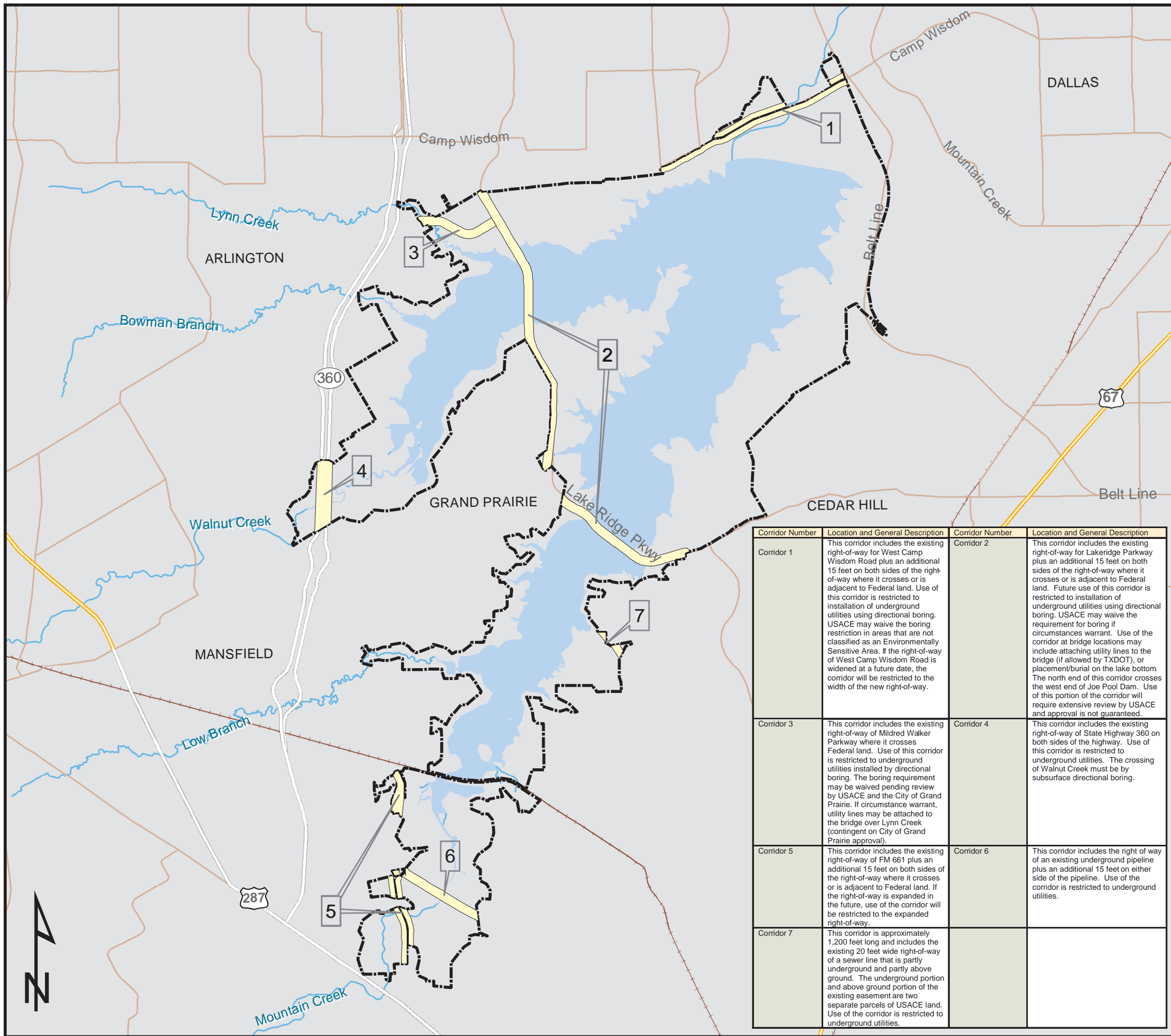
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APPENDIX A - LAND CLASSIFICATION, MANAGING AGENCIES, AND RECREATION MAPS



Corridor Number	Location and General Description	Corridor Number	Location and General Description
Corridor 1	This corridor includes the existing right-of-way for West Camp Wisdom Road plus an additional 15 feet on both sides of the right-of-way where it crosses or is adjacent to Federal land. Use of this corridor is restricted to installation of underground utilities using directional boring. USACE may waive the boring restriction in areas that are not classified as an Environmentally Sensitive Area. If the right-of-way of West Camp Wisdom Road is widened at a future date, the corridor will be restricted to the width of the new right-of-way.	Corridor 2	This corridor includes the existing right-of-way for Lakeridge Parkway plus an additional 15 feet on both sides of the right-of-way where it crosses or is adjacent to Federal land. Future use of this corridor is restricted to installation of underground utilities using directional boring. USACE may waive the requirement for boring if circumstances warrant. Use of the corridor at bridge locations may include attaching utility lines to the bridge (if allowed by TXDOT), or placement/burial on the lake bottom. The north end of this corridor crosses the west end of Joe Pool Dam. Use of this portion of the corridor will require extensive review by USACE and approval is not guaranteed.
Corridor 3	This corridor includes the existing right-of-way of Mildred Walker Parkway where it crosses Federal land. Use of this corridor is restricted to underground utilities installed by directional boring. The boring requirement may be waived pending review by USACE and the City of Grand Prairie. If circumstance warrant, utility lines may be attached to the bridge over Lynn Creek (contingent on City of Grand Prairie approval).	Corridor 4	This corridor includes the existing right-of-way of State Highway 360 on both sides of the highway. Use of this corridor is restricted to underground utilities. The crossing of Walnut Creek must be by subsurface directional boring.
Corridor 5	This corridor includes the existing right-of-way of FM 661 plus an additional 15 feet on both sides of the right-of-way where it crosses or is adjacent to Federal land. If the right-of-way is expanded in the future, use of the corridor will be restricted to the expanded right-of-way.	Corridor 6	This corridor includes the right of way of an existing underground pipeline plus an additional 15 feet on either side of the pipeline. Use of the corridor is restricted to underground utilities.
Corridor 7	This corridor is approximately 1,200 feet long and includes the existing 20 feet wide right-of-way of a sewer line that is partly underground and partly above ground. The underground portion and above ground portion of the existing easement are two separate parcels of USACE land. Use of the corridor is restricted to underground utilities.		




U.S. ARMY CORPS OF ENGINEERS
FORT WORTH DISTRICT

JOE POOL LAKE MOUNTAIN CREEK, TEXAS

JOE POOL LAKE

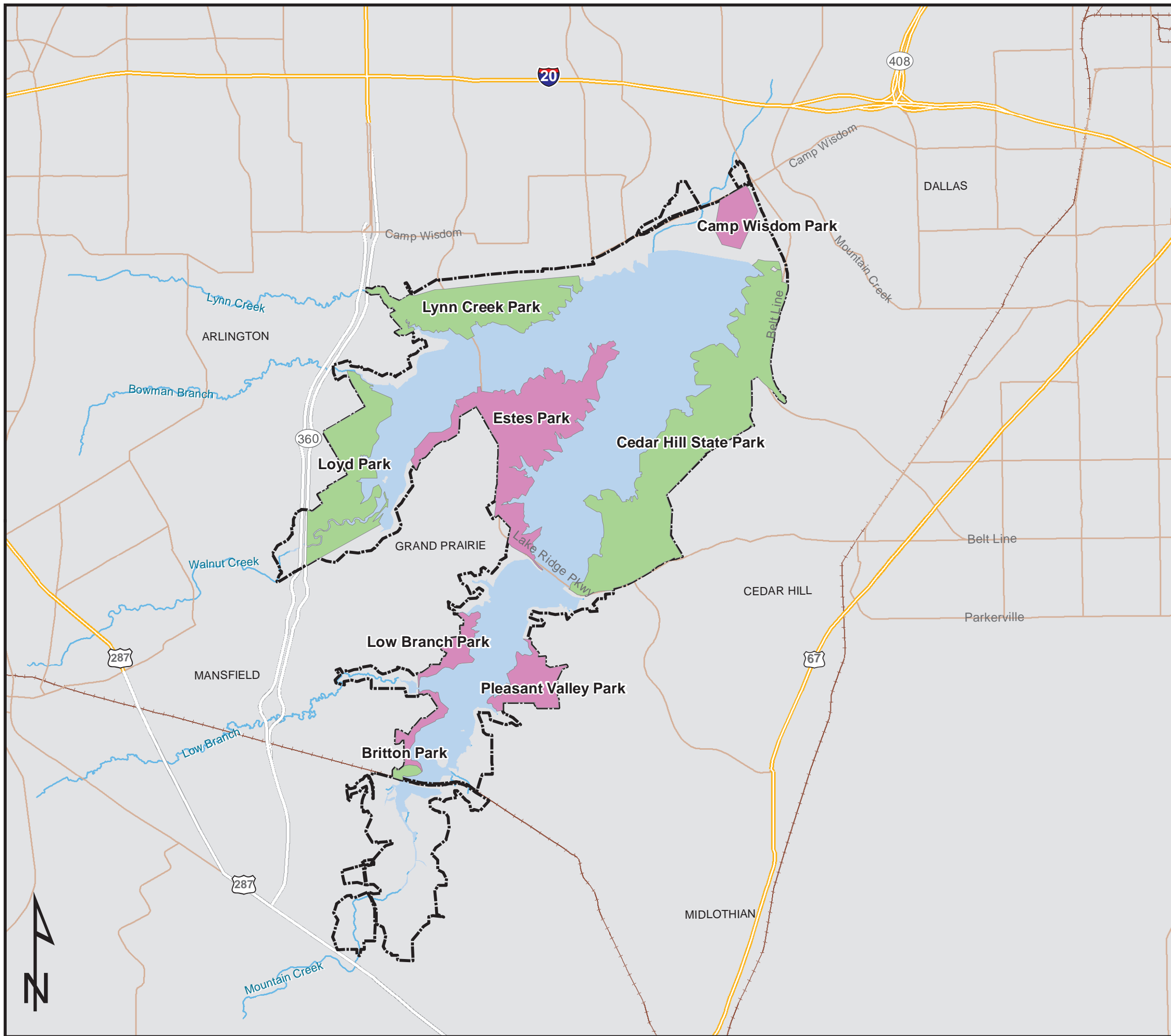
JOE POOL LAKE MASTER PLAN




UTILITY CORRIDOR MAP




DATE: JANUARY 2019	MAP NO. JP18MP-OU-01
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-  PROJECT BOUNDARY
- RECREATION AREAS
-  DEVELOPED
-  UNDEVELOPED



**U.S. ARMY CORPS
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FORT WORTH DISTRICT

JOE POOL LAKE

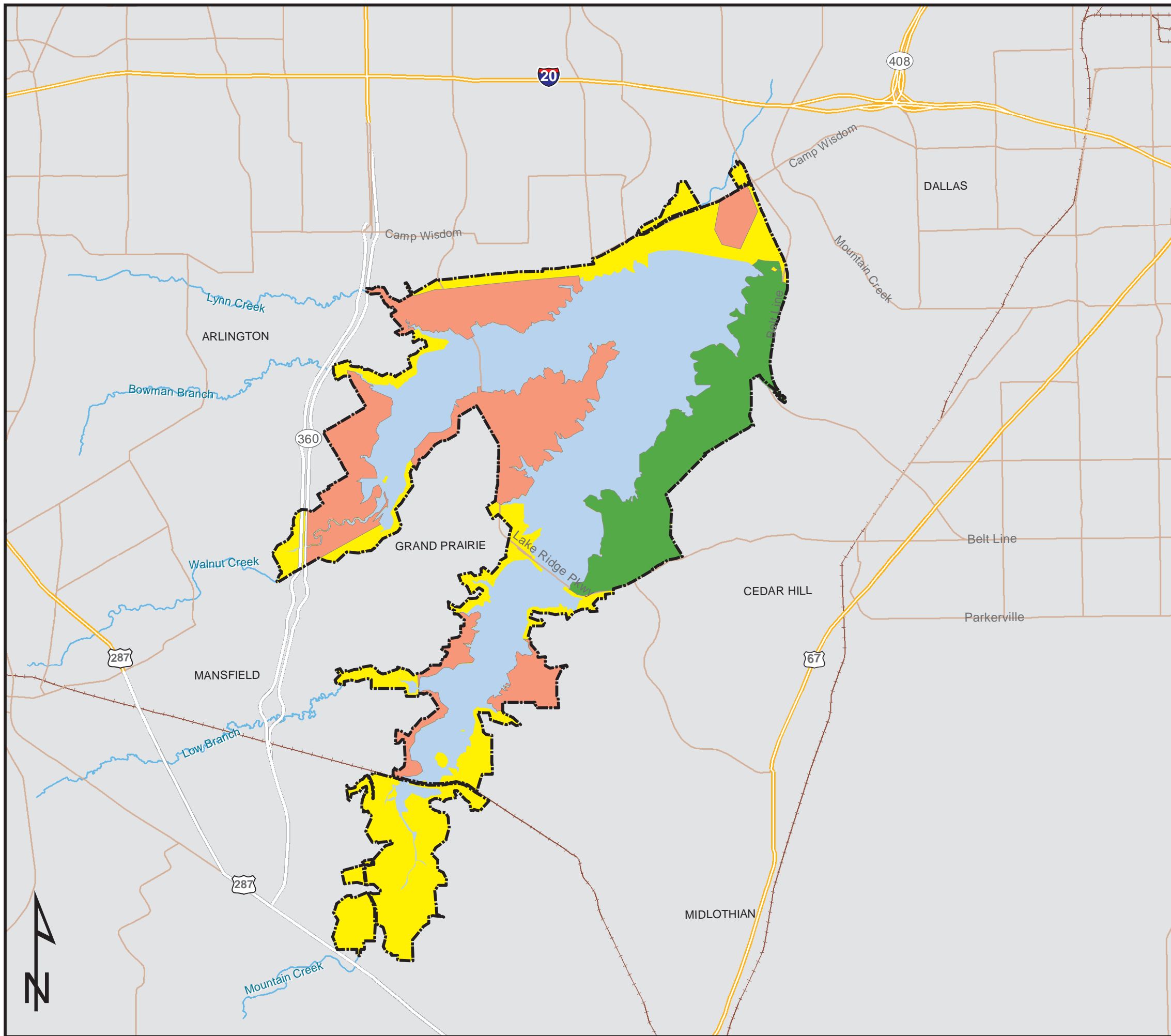
JOE POOL LAKE MASTER PLAN





RECREATIONAL MAP

0 1 2 3 MILES



DATE: FEBRUARY 2019	MAP NO. JP18MP-OR-01
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-  Project Boundary
-  U.S. ARMY CORPS OF ENGINEERS
-  TEXAS PARKS AND WILDLIFE
-  CITY OF GRAND PRAIRIE



U.S. ARMY CORPS OF ENGINEERS
FORT WORTH DISTRICT

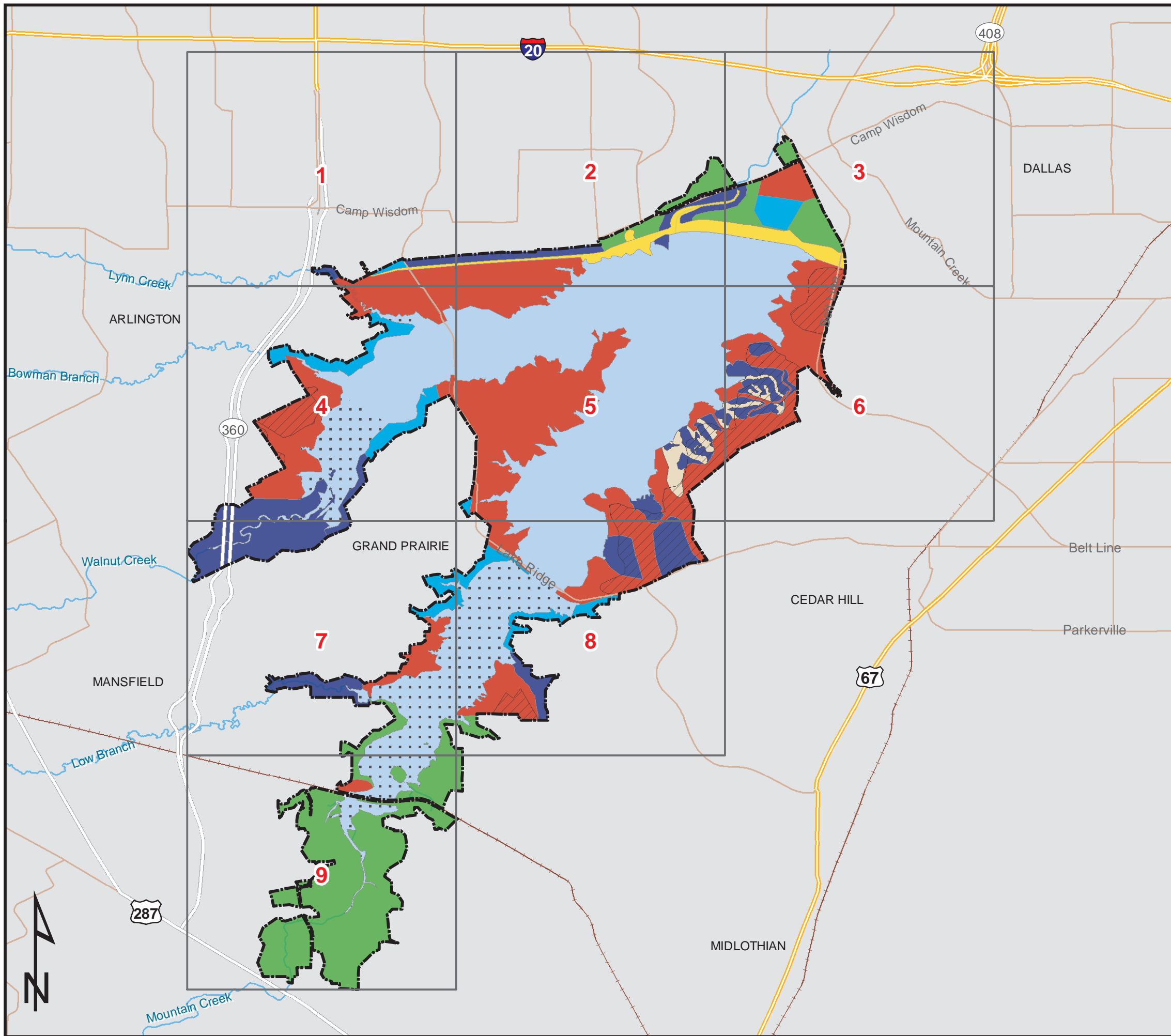
JOE POOL LAKE MOUNTAIN CREEK, TEXAS

JOE POOL LAKE
JOE POOL LAKE MASTER PLAN
LAND MANAGING ENTITIES



DATE: JANUARY 2019	MAP NO. JP18MP-OM-01
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-  PROJECT BOUNDARY
- LAND CLASSIFICATION**
-  PROJECT OPERATIONS
-  HIGH DENSITY RECREATION
-  ENVIRONMENTALLY SENSITIVE AREA
-  LOW DENSITY RECREATION
-  VEGETATIVE MANAGEMENT
-  WILDLIFE MANAGEMENT
-  UNCLEARED WATER SURFACE
-  WATER SURFACE
- LAND ALLOCATION**
-  SEPARABLE RECREATION LANDS




U.S. ARMY CORPS OF ENGINEERS
FORT WORTH DISTRICT

JOE POOL LAKE MOUNTAIN CREEK, TEXAS

JOE POOL LAKE

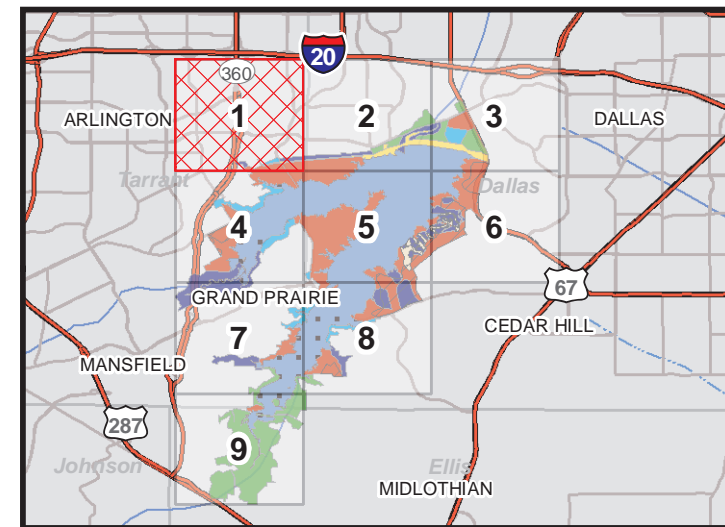
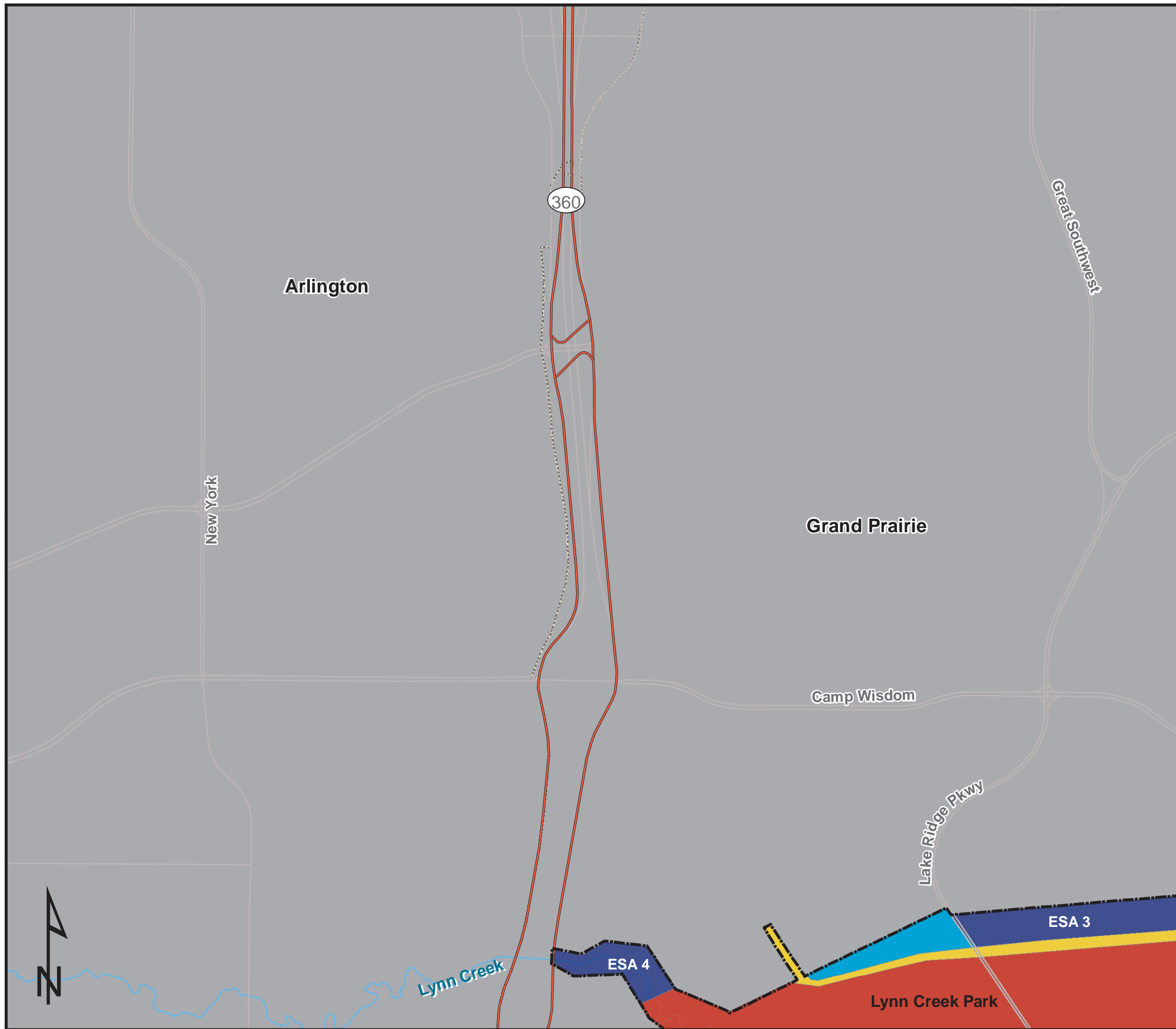
JOE POOL LAKE MASTER PLAN

LAND CLASSIFICATION INDEX (SHEET 00)



DATE: FEBRUARY 2019	MAP NO. JP18MP-OC-00
------------------------	-------------------------





-  MARINA
-  PROJECT BOUNDARY
-  UNCLEARED WATER SURFACE
- LAND CLASSIFICATION**
-  PROJECT OPERATIONS
-  HIGH DENSITY RECREATION
-  ENVIRONMENTALLY SENSITIVE AREA
-  LOW DENSITY RECREATION
-  VEGETATIVE MANAGEMENT
-  WILDLIFE MANAGEMENT
- LAND ALLOCATION**
-  SEPARABLE RECREATION LANDS
- WATER SURFACE**
-  OPEN RECREATION
-  NO WAKE
-  RESTRICTED



**U.S. ARMY CORPS
OF ENGINEERS**
FORT WORTH DISTRICT

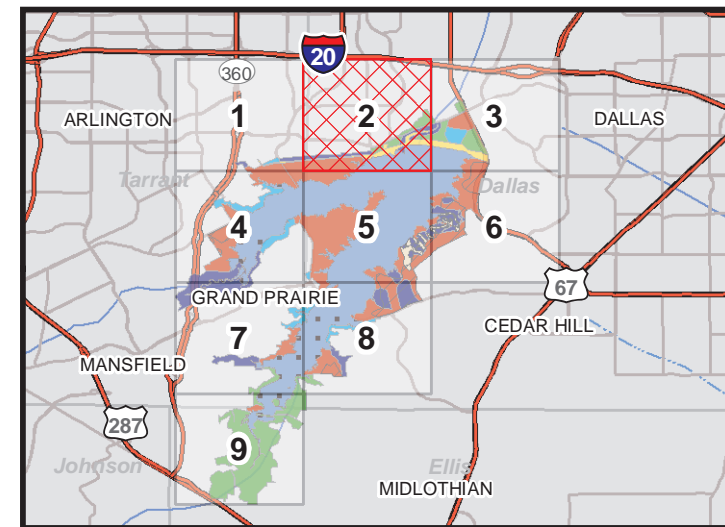
JOE POOL LAKE MOUNTAIN CREEK, TEXAS

JOE POOL LAKE
JOE POOL LAKE MASTER PLAN
LAND CLASSIFICATION (SHEET 01)



DATE:
FEBRUARY 2019

MAP NO.
JP18MP-OC-01



-  MARINA
-  PROJECT BOUNDARY
-  UNCLEARED WATER SURFACE
- LAND CLASSIFICATION**
-  PROJECT OPERATIONS
-  HIGH DENSITY RECREATION
-  ENVIRONMENTALLY SENSITIVE AREA
-  LOW DENSITY RECREATION
-  VEGETATIVE MANAGEMENT
-  WILDLIFE MANAGEMENT
- LAND ALLOCATION**
-  SEPARABLE RECREATION LANDS
- WATER SURFACE**
-  OPEN RECREATION
-  NO WAKE
-  RESTRICTED



**U.S. ARMY CORPS
OF ENGINEERS**


FORT WORTH DISTRICT

JOE POOL LAKE MOUNTAIN CREEK, TEXAS

JOE POOL LAKE

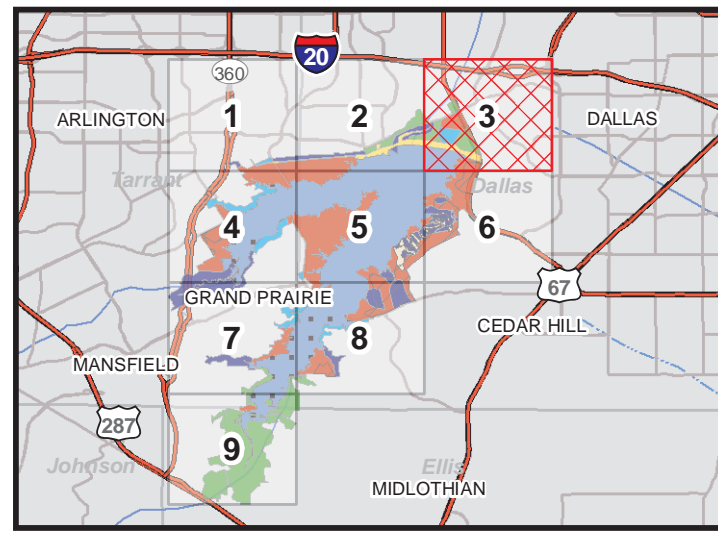
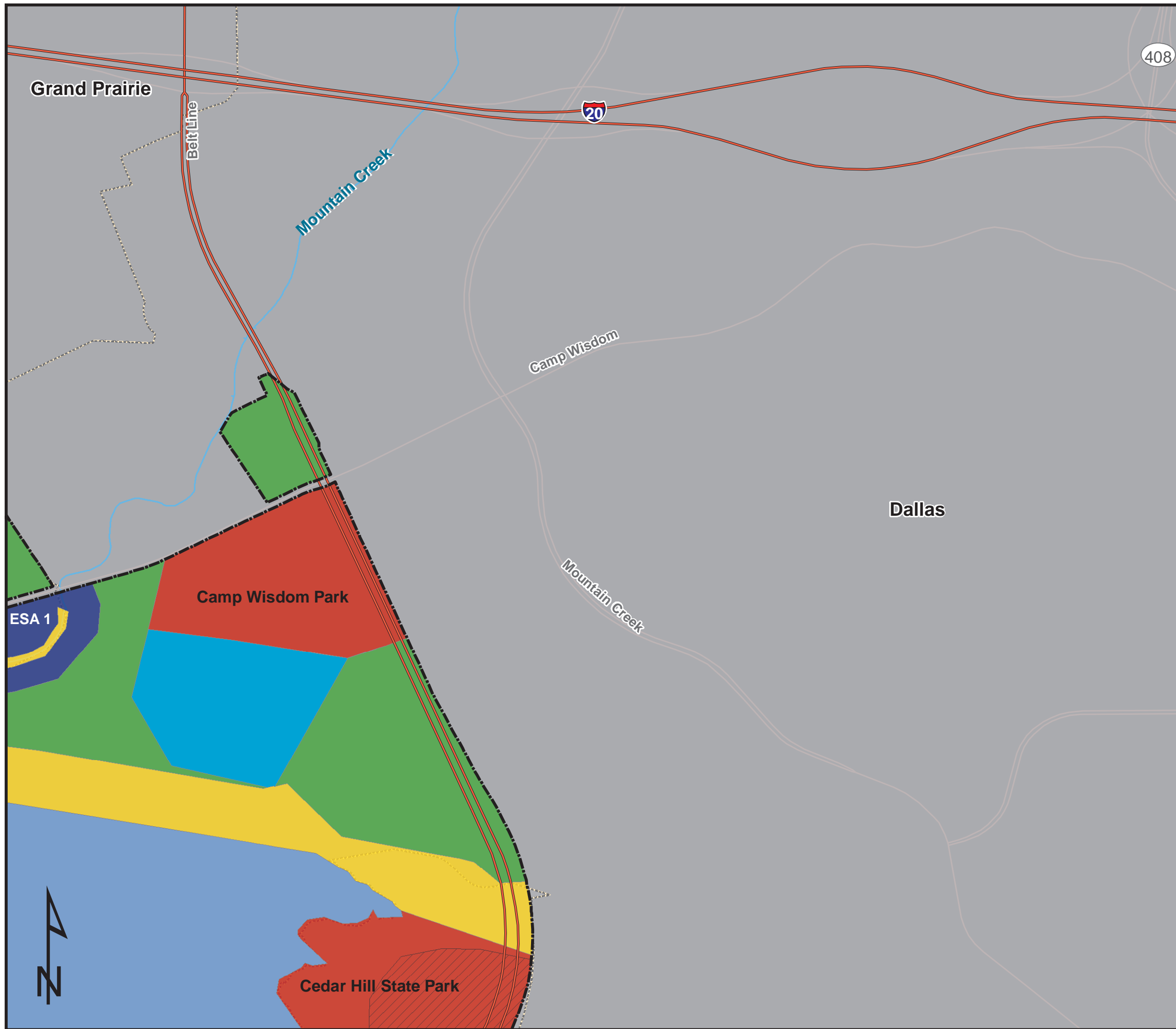
JOE POOL LAKE MASTER PLAN


LAND CLASSIFICATION (SHEET 02)



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FEET

DATE: FEBRUARY 2019	MAP NO. JP18MP-OC-02
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-  MARINA
-  PROJECT BOUNDARY
-  UNCLEARED WATER SURFACE
- LAND CLASSIFICATION**
-  PROJECT OPERATIONS
-  HIGH DENSITY RECREATION
-  ENVIRONMENTALLY SENSITIVE AREA
-  LOW DENSITY RECREATION
-  VEGETATIVE MANAGEMENT
-  WILDLIFE MANAGEMENT
- LAND ALLOCATION**
-  SEPARABLE RECREATION LANDS
- WATER SURFACE**
-  OPEN RECREATION
-  NO WAKE
-  RESTRICTED



**U.S. ARMY CORPS
OF ENGINEERS**

FORT WORTH DISTRICT


JOE POOL LAKE MOUNTAIN CREEK, TEXAS

JOE POOL LAKE

JOE POOL LAKE MASTER PLAN

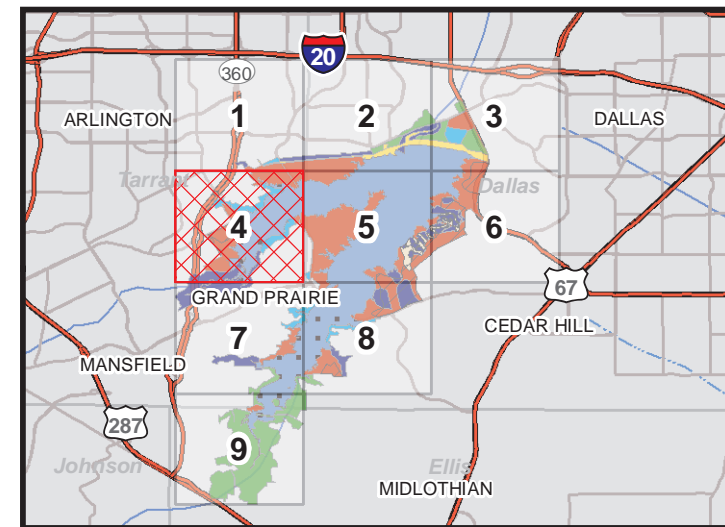
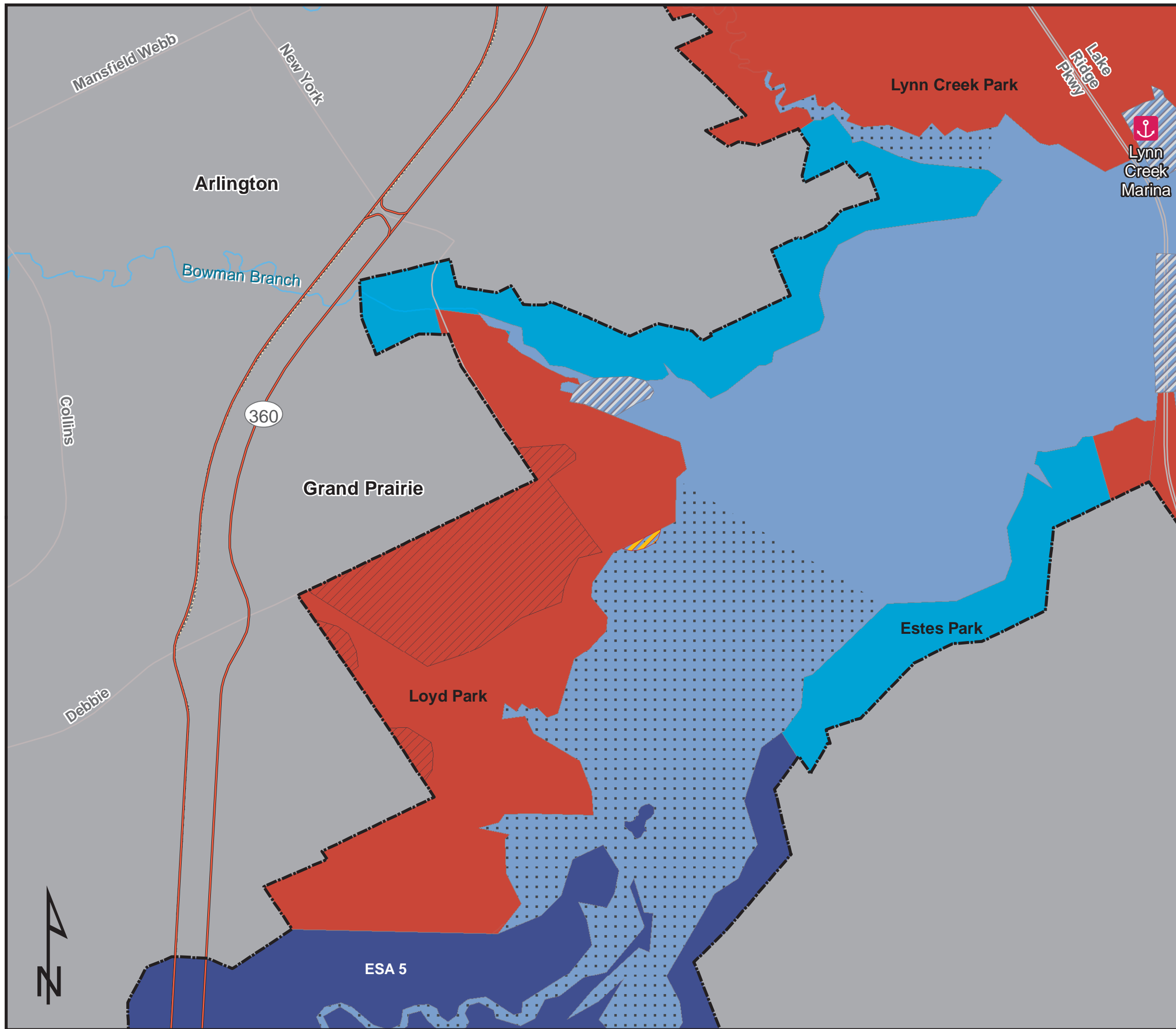
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-  MARINA
-  PROJECT BOUNDARY
-  UNCLEARED WATER SURFACE
- LAND CLASSIFICATION**
-  PROJECT OPERATIONS
-  HIGH DENSITY RECREATION
-  ENVIRONMENTALLY SENSITIVE AREA
-  LOW DENSITY RECREATION
-  VEGETATIVE MANAGEMENT
-  WILDLIFE MANAGEMENT
- LAND ALLOCATION**
-  SEPARABLE RECREATION LANDS
- WATER SURFACE**
-  OPEN RECREATION
-  NO WAKE
-  RESTRICTED



**U.S. ARMY CORPS
OF ENGINEERS**


FORT WORTH DISTRICT

JOE POOL LAKE MOUNTAIN CREEK, TEXAS

JOE POOL LAKE

JOE POOL LAKE MASTER PLAN

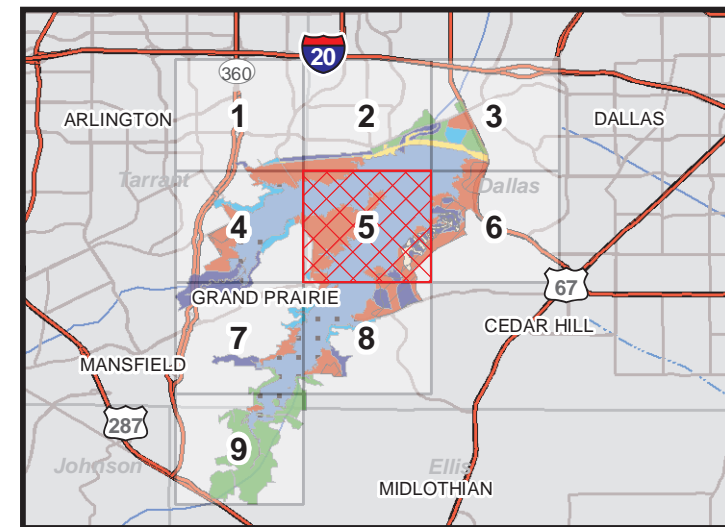
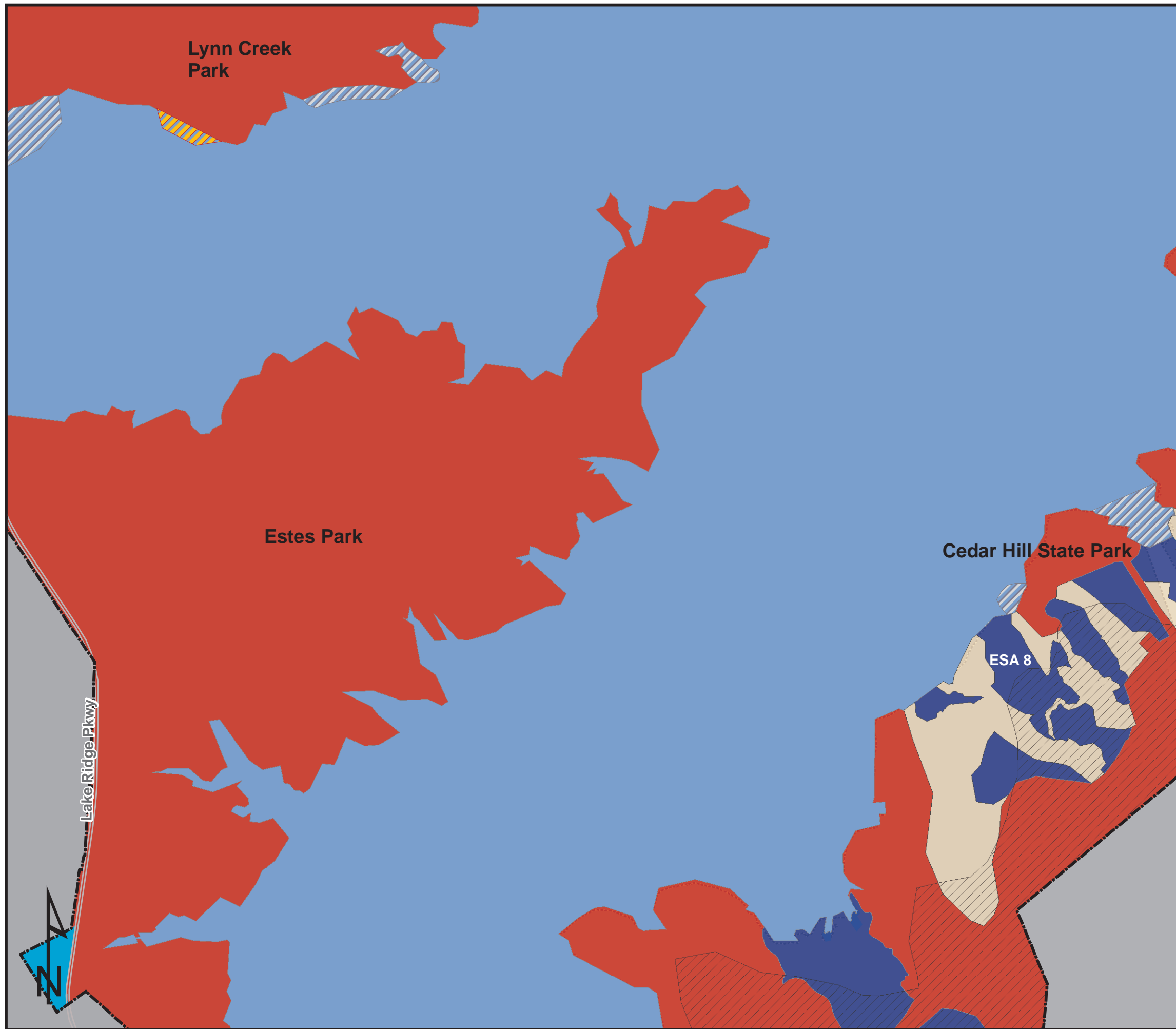
LAND CLASSIFICATION (SHEET 04)




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DATE: FEBRUARY 2019	MAP NO. JP18MP-OC-04
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-  PROJECT BOUNDARY
-  UNCLEARED WATER SURFACE
- LAND CLASSIFICATION**
-  PROJECT OPERATIONS
-  HIGH DENSITY RECREATION
-  ENVIRONMENTALLY SENSITIVE AREA
-  LOW DENSITY RECREATION
-  VEGETATIVE MANAGEMENT
-  WILDLIFE MANAGEMENT
- LAND ALLOCATION**
-  SEPARABLE RECREATION LANDS
- WATER SURFACE**
-  OPEN RECREATION
-  NO WAKE
-  RESTRICTED



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FORT WORTH DISTRICT

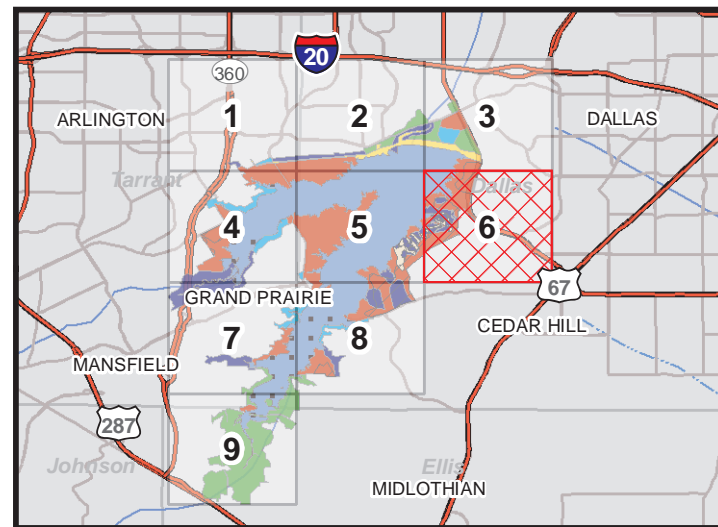
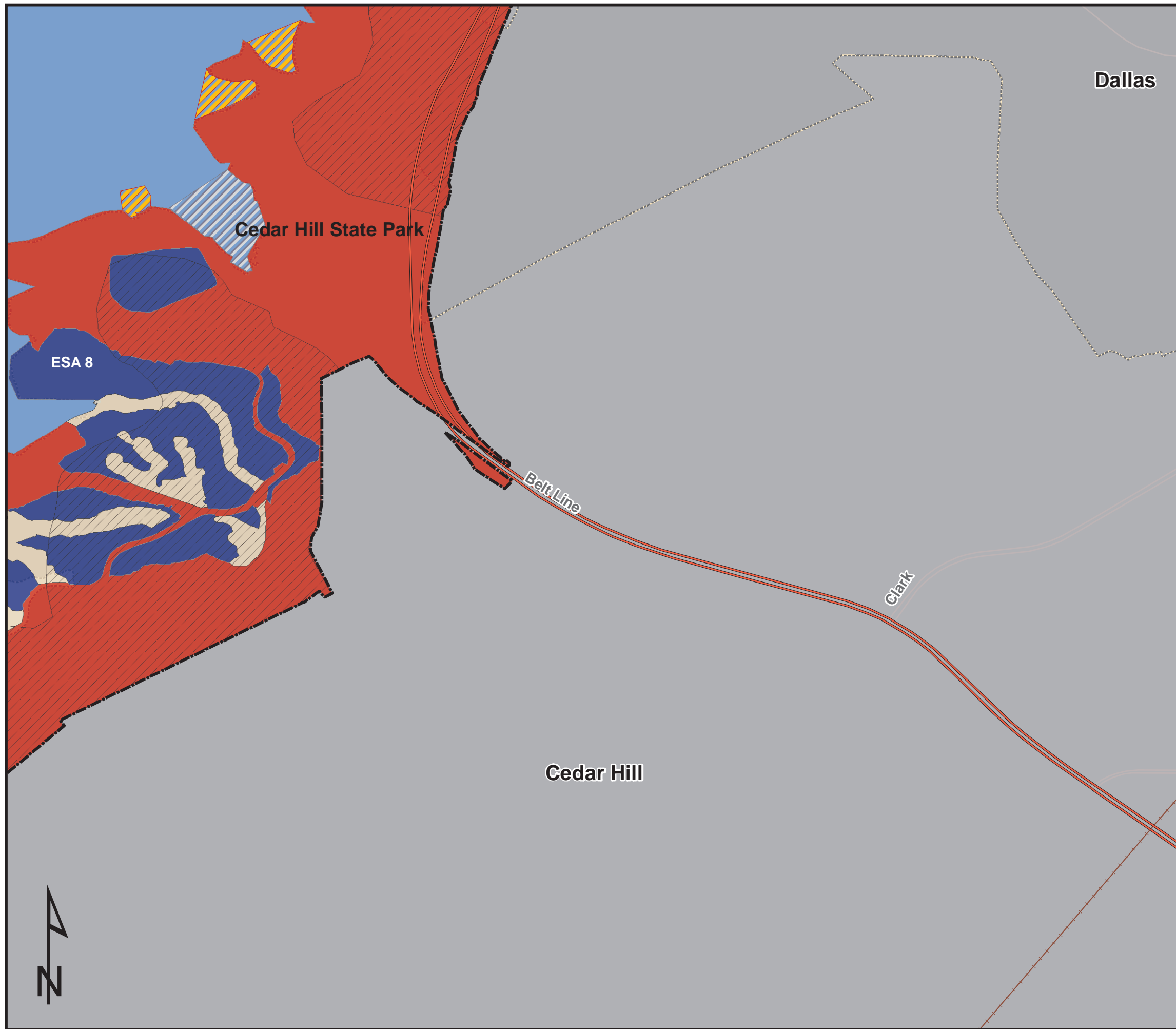
JOE POOL LAKE MOUNTAIN CREEK, TEXAS



JOE POOL LAKE
JOE POOL LAKE MASTER PLAN
LAND CLASSIFICATION (SHEET 05)



DATE:
FEBRUARY 2019

MAP NO.
JP18MP-OC-05



-  MARINA
-  PROJECT BOUNDARY
-  UNCLEARED WATER SURFACE
- LAND CLASSIFICATION**
-  PROJECT OPERATIONS
-  HIGH DENSITY RECREATION
-  ENVIRONMENTALLY SENSITIVE AREA
-  LOW DENSITY RECREATION
-  VEGETATIVE MANAGEMENT
-  WILDLIFE MANAGEMENT
- LAND ALLOCATION**
-  SEPARABLE RECREATION LANDS
- WATER SURFACE**
-  OPEN RECREATION
-  NO WAKE
-  RESTRICTED



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OF ENGINEERS**


FORT WORTH DISTRICT

JOE POOL LAKE MOUNTAIN CREEK, TEXAS

JOE POOL LAKE

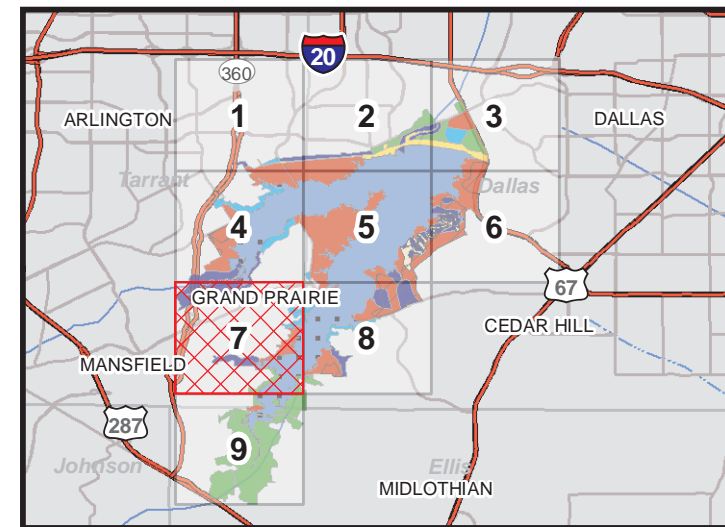
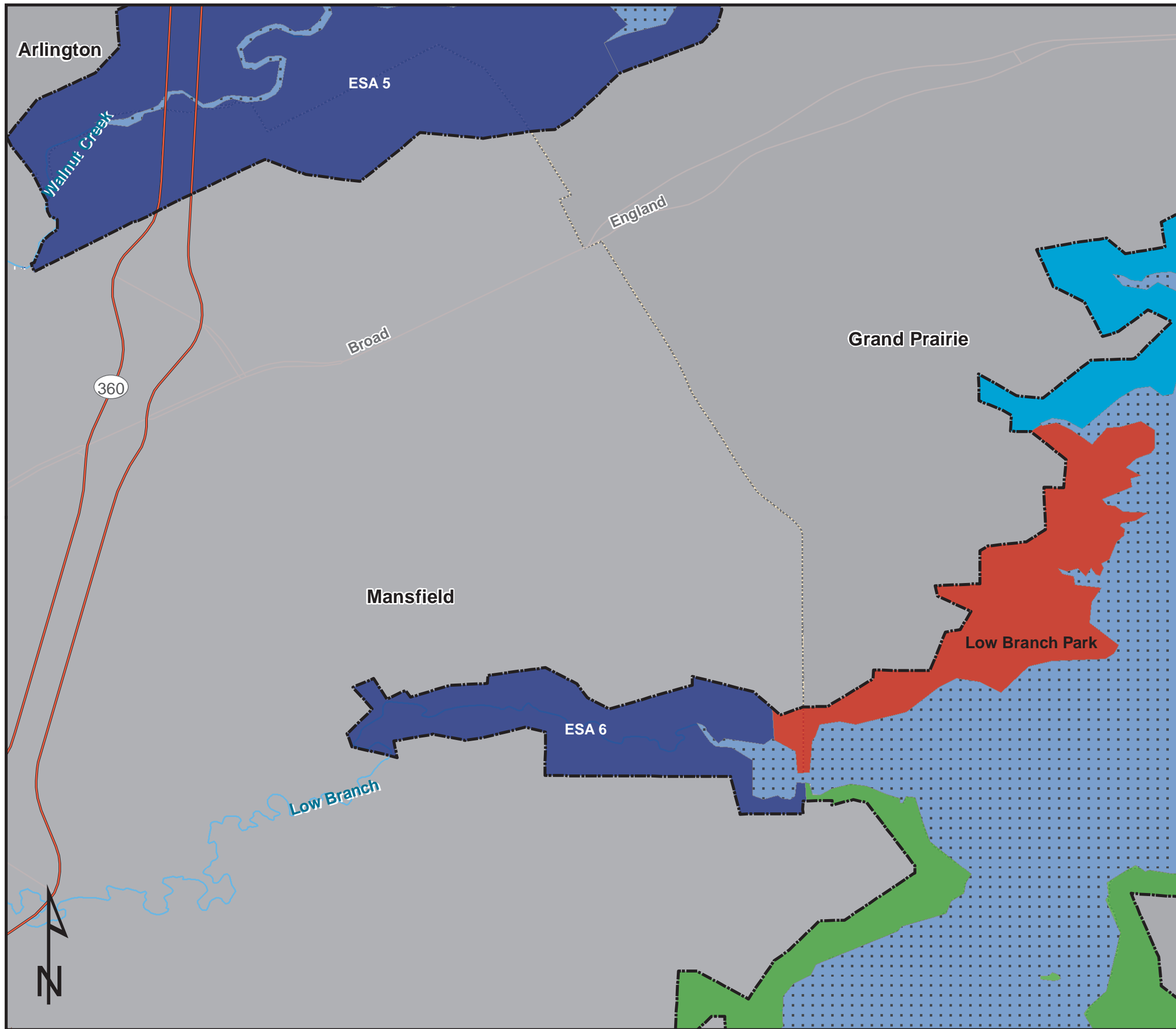
JOE POOL LAKE MASTER PLAN

LAND CLASSIFICATION (SHEET 06)



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DATE: FEBRUARY 2019	MAP NO. JP18MP-OC-06
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-  MARINA
-  PROJECT BOUNDARY
-  UNCLEARED WATER SURFACE
- LAND CLASSIFICATION**
-  PROJECT OPERATIONS
-  HIGH DENSITY RECREATION
-  ENVIRONMENTALLY SENSITIVE AREA
-  LOW DENSITY RECREATION
-  VEGETATIVE MANAGEMENT
-  WILDLIFE MANAGEMENT
- LAND ALLOCATION**
-  SEPARABLE RECREATION LANDS
- WATER SURFACE**
-  OPEN RECREATION
-  NO WAKE
-  RESTRICTED



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OF ENGINEERS**


FORT WORTH DISTRICT

JOE POOL LAKE MOUNTAIN CREEK, TEXAS

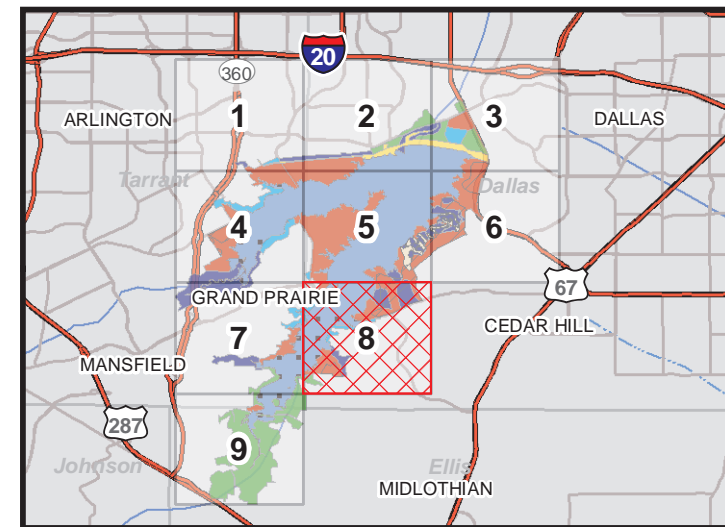
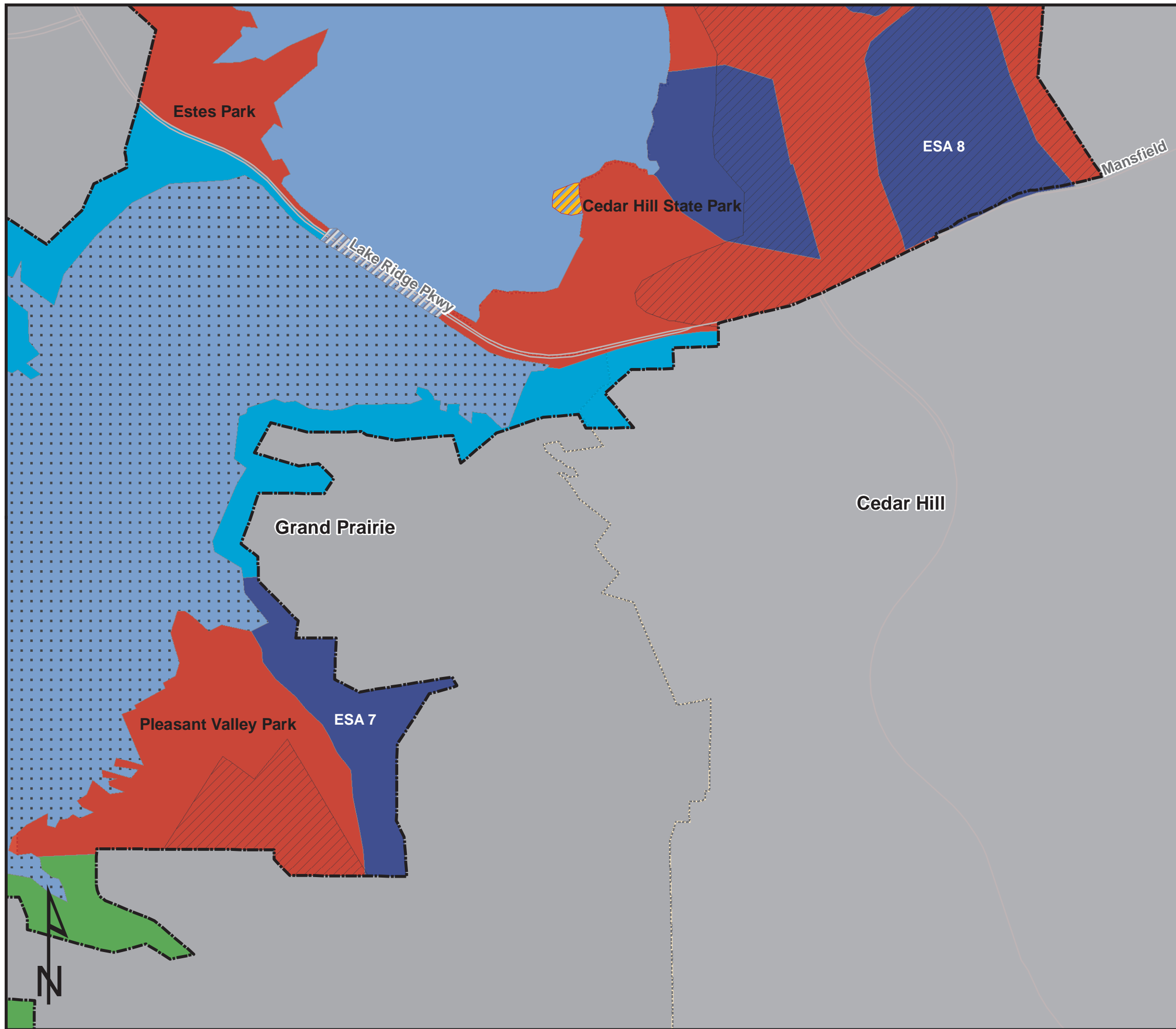
JOE POOL LAKE










JOE POOL LAKE MASTER PLAN

LAND CLASSIFICATION (SHEET 07)



DATE: FEBRUARY 2019	MAP NO. JP18MP-OC-07
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-  MARINA
-  PROJECT BOUNDARY
-  UNCLEARED WATER SURFACE
- LAND CLASSIFICATION**
-  PROJECT OPERATIONS
-  HIGH DENSITY RECREATION
-  ENVIRONMENTALLY SENSITIVE AREA
-  LOW DENSITY RECREATION
-  VEGETATIVE MANAGEMENT
-  WILDLIFE MANAGEMENT
- LAND ALLOCATION**
-  SEPARABLE RECREATION LANDS
- WATER SURFACE**
-  OPEN RECREATION
-  NO WAKE
-  RESTRICTED



**U.S. ARMY CORPS
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FORT WORTH DISTRICT

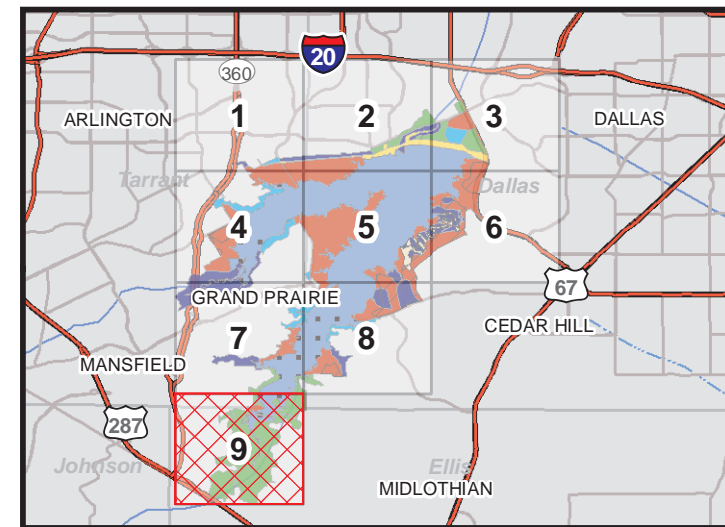
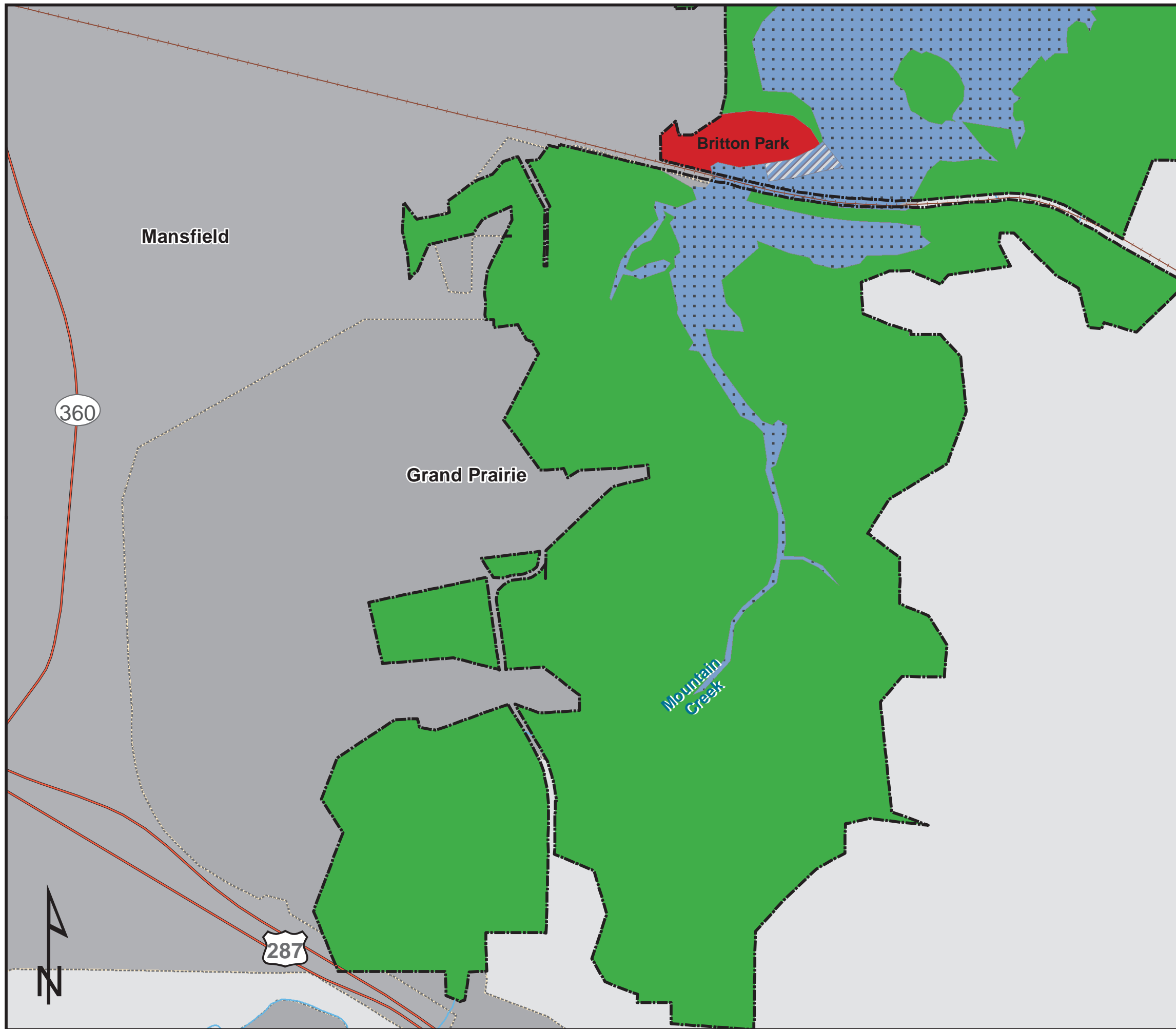
JOE POOL LAKE MOUNTAIN CREEK, TEXAS

JOE POOL LAKE
JOE POOL LAKE MASTER PLAN
LAND CLASSIFICATION (SHEET 08)

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DATE:
FEBRUARY 2019

MAP NO.
JP18MP-OC-08



-  MARINA
-  PROJECT BOUNDARY
-  UNCLEARED WATER SURFACE
- LAND CLASSIFICATION**
-  PROJECT OPERATIONS
-  HIGH DENSITY RECREATION
-  ENVIRONMENTALLY SENSITIVE AREA
-  LOW DENSITY RECREATION
-  VEGETATIVE MANAGEMENT
-  WILDLIFE MANAGEMENT
- LAND ALLOCATION**
-  SEPARABLE RECREATION LANDS
- WATER SURFACE**
-  OPEN RECREATION
-  NO WAKE
-  RESTRICTED



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FORT WORTH DISTRICT

JOE POOL LAKE MOUNTAIN CREEK, TEXAS

JOE POOL LAKE
JOE POOL LAKE MASTER PLAN
LAND CLASSIFICATION (SHEET 09)



DATE:
FEBRUARY 2019

MAP NO.
JP18MP-OC-09

**APPENDIX B - NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)
DOCUMENTATION**

Environmental Assessment for the Joe Pool Lake Master Plan

Trinity River Basin, Mountain Creek Watershed
Dallas, Tarrant, and Ellis Counties, Texas



March 2019



**US Army Corps
of Engineers** ®
Fort Worth District

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**FINDING OF NO SIGNIFICANT IMPACT
ENVIRONMENTAL ASSESSMENT FOR THE
JOE POOL LAKE MASTER PLAN
Dallas, Tarrant, and Ellis Counties, Texas**

In accordance with the National Environmental Policy Act of 1969, including guidelines in 33 Code of Federal Regulations Part 230, the Fort Worth District and the Regional Planning and Environmental Center (RPEC) of the U.S. Army Corps of Engineers (USACE) have assessed the potential impacts of the Joe Pool Lake Master Plan revision (2019 Master Plan).

The 2019 Master Plan is a revision of the 1981 Master Plan that was the original Master Plan for the project. The revised Master Plan will provide guidance for stewardship of natural resources and management of long-term public access to, and use of, the natural resources of Joe Pool Lake and Dam, including the land use classification of the USACE-managed lands. The Master Plan provides a comprehensive description of the project, a discussion of factors influencing resource management and development, new resource management objectives, the resource plan describing how project lands and waters will be managed, an identification and discussion of special topics, a synopsis of public involvement and input into the planning process, and descriptions of existing development.

Under the No Action Alternative, the USACE would take no action, which means the Master Plan would not be revised. With this alternative, no new resources analysis or land use reclassifications would occur. The operation and management of Joe Pool Lake would continue as outlined in the current Master Plan.

The Proposed Action includes Master Plan Revisions, coordination with the public, and updates to comply with the USACE regulation and guidance, and reflects changes in land management and the land uses that have occurred since 1981. Land classifications were refined to meet authorized project purposes and current natural resource and recreation management objectives that are compatible with regional goals, recognize outdoor recreation trends, and are responsive to public comment. Required land and water surface classification changes associated with the Proposed Action include the following:

Proposal	Description	Justification
Project Operations (PO)	Project Operations lands were decreased from 309 acres to 308 acres from the prior classification. Lands classified as PO lands were reclassified as follows: <ul style="list-style-type: none"> ○ 7 acres surrounding the uncontrolled spillway was changed from Recreation – High Use to Project Operations ○ 10 acres of Project Operations land was changed to Environmentally Sensitive Area (ESA). 	The 7 acre change recognizes that the uncontrolled spillway is a major operational facility and must be classified as Project Operations. Recreational fishing at the uncontrolled spillway is an incidental use subservient to the primary purpose of the spillway. The 10 acres west of the gate control tower was changed to ESA to recognize important cultural resources.

Proposal	Description	Justification
<p>High Density Recreation (HDR)</p>	<p>Most lands under the prior classifications of Recreation – High Use and Recreation – High Use/Interim Wildlife were converted to the new and similar classification of HDR, but were reduced from 4,992 acres to 4,043 acres through the following reclassifications:</p> <ul style="list-style-type: none"> ○ 7 acres at uncontrolled spillway changed to PO ○ 291 acres in Loyd Park and 512 acres of CHSP changed to ESA ○ 157 acres changed from Recreation – High Use to Vegetative Management in Cedar Hill State Park (CHSP) ○ 87 acres of Britton Park changed to Multiple Resource Management Lands (MRML) – Wildlife Management (WM) ○ 69 acres of Pleasant Valley Park changed to ESA ○ 96 acres of Recreation – High Use/Interim Wildlife in Estes Park changed to MRML-Low Density Recreation (LDR) ○ 275 acres of Recreation/Wildlife Management – Low Use changed to HDR ((area to be added to Estes Park (177-acres) and HDR portion of Camp Wisdom Park (98-acres) ○ 5 acres of west portion of Lynn Creek Park changed to ESA 	<p>Each of these changes were needed to recognize the following project operational needs:</p> <ul style="list-style-type: none"> ○ 7 acres changed to PO at uncontrolled spillway ○ 1,021 acres change to ESA to recognize high habitat values, important vegetation values, and cultural resource values ○ 275 acres changed to HDR to meet anticipated recreation needs in Estes and Camp Wisdom parks <p>These classification changes will have little to no effect on current or future public use.</p>
<p>Environmentally Sensitive Areas (ESA)</p>	<p>The classification of 1,507 acres as Environmentally Sensitive Areas resulted from</p>	<p>These classification changes were necessary to recognize those areas at</p>

Proposal	Description	Justification
	<p>the following land classification changes:</p> <ul style="list-style-type: none"> ○ 291 acres of Loyd Park and 512 acres of CHSP from Recreation – High Use to ESA. ○ 10 acres of PO lands to ESA ○ 620 acres of Recreation/Wildlife Management – Low Use to ESA ○ 69 acres of Recreation – High Use / Interim Wildlife (Pleasant Valley Park) to ESA ○ 5 acres of Recreation – High Use / Interim Wildlife (west end of Lynn Creek Park) to ESA 	<p>the project having the highest ecological value, areas serving as filters for surface water runoff, and areas having high cultural resource values. Reclassification to ESA status will have little to no effect on current or projected public use. Lands classified as ESA are given the highest order of protection among possible land classifications. These classification changes will have little to no effect on current or future public use.</p>
MRML – LDR	<p>Acreage of MRML – LDR lands totals 578 acres. Approximately 482 acres of former Recreation / Wildlife Management – Low Use was reclassified as MRML – Low Density Recreation. The parcels that were changed included a 91 acre portion of undeveloped Camp Wisdom Park and five distinct additional parcels consisting primarily of narrow shoreline parcels located immediately adjacent to private property. Additionally, 96 acres of former Recreation – High Use/Interim Wildlife land in Estes Park was reclassified as MRML – Low Density Recreation.</p>	<p>This classification change of 482 acres was primarily a change in nomenclature from old to new. The 96 acre change was partly in response to public comment and partly to the City of Grand Prairie’s future plans for the 96 acres. Considering the configuration of the parcels in question, as well as their historic and anticipated use, the MRML – LDR classification is the most appropriate. If a nature trail is eventually placed on the 96 acres as envisioned by Grand Prairie, and the area is managed as a controlled access park, passive use of the area by neighboring landowners may be curtailed.</p>
MRML – Vegetative Management (VM)	<p>Approximately 157 acres of former Recreation – High Use</p>	<p>This reclassification involves several distinct</p>

Proposal	Description	Justification
	lands was reclassified to MRML - VM	parcels in CHSP where Texas Parks and Wildlife Department (TPWD) is restoring native blackland prairie habitat.
MRML – WM	<p>The 2,070 acres of MRML – WM land resulted from a simple name change on 1,983 acres of former Recreation / Wildlife Management – Low Use as well as the following classification changes: 87 acres of Recreation – High Use / Interim Wildlife (north end of Britton Park) changed to MRML-WM</p> <ul style="list-style-type: none"> ○ 10 acres of Recreation / Wildlife – Low Use was changed to ESA along the west end of the Lynn Creek riparian corridor ○ 482 acres of Recreation / Wildlife Management – Low Use changed to LDR ○ 114 acres of Recreation / Wildlife Management – Low Use changed to ESA (area parallel to toe of dam) ○ 289 acres of Recreation / Wildlife Management – Low Use changed to ESA (along Walnut Creek) ○ 120 acres of Recreation / Wildlife Management – Low Use changed to ESA (Low Branch riparian corridor) ○ 275 acres of Recreation / Wildlife Management – Low Use changed to HDR 	<p>The 87-acre undeveloped northern portion of Britton Park was reclassified to MRML – WM. Ten acres of riparian corridor on the west end of Lynn Creek was reclassified as ESA. The 482 acre change to MRML - LDR was needed as explained above under the MRML-LDR classification. The 114 acre change to ESA is a parcel parallel to the western downstream toe of the dam that is needed as a visual buffer and is used for mitigation plantings. The 275 acre change to HDR was needed to properly classify Camp Wisdom Park and to make a logical addition of 177 acres to Estes Park. The 87-acre parcel below Joe Pool dam is a riparian corridor along the outlet channel. These classification changes will have little to no effect on current or future public use.</p>

Proposal	Description	Justification
	<p>(98 acres added to Camp Wisdom Park and 177 acres added to Estes Park)</p> <ul style="list-style-type: none"> ○ 87 acres of Recreation / Wildlife Management – Low Use Changed to ESA (along Mountain Creek below dam) 	
Utility Corridors	<p>Seven utility corridors were identified to serve as preferred locations for future outgrants such as easements for roads and utility lines on USACE lands at Joe Pool Lake. Descriptions of each corridor can be found in Section 6.1 of the 2019 Master Plan</p>	<p>Utility corridors identify areas for current and future utility use that would also limit further fragmentation of existing habitat at Joe Pool Lake.</p>
Water Surface	<p>The classification of 6,707 acres of water surface of the lake at the conservation pool elevation is as follows:</p> <ul style="list-style-type: none"> ○ 24 acres of Restricted water surface at Joe Pool Lake include the water surface in front of the intake structure at the control tower at Joe Pool Dam and designated swimming areas in Lynn Creek Park and CHSP. Buoys mark the line in front of the dam. Keep-out buoys and floating barrier pipes mark the designated swimming areas in each park. ○ 103 acres of Designated No-Wake areas are in place near the 7 boat ramps, along Lakeridge 	<p>Restricted and Designated No-Wake areas are necessary for public safety reasons. The Water Use Plan in the 1981 Master Plan designated the upper portions of the Mountain Creek and Walnut Creek arms of the lake as a “Low Speed Boating Area”, but these area are now included in the Open Recreation classification. It is incumbent on boaters to operate their vessel safely in these uncleared areas. The classification of water surfaces will have no effect on current or projected public use</p>

Proposal	Description	Justification
	Parkway bridges, and at the marina. There are 6,580 acres of Open Recreation water surface at Joe Pool Lake.	

*The land classification changes described in this table are the result of changes to 26 individual parcels of land ranging from a few acres to more than 100 hundred acres. Acreages were measured using geographic information system (GIS) technology. The acreage numbers provided are approximate. Also, with the exception of the Project Operations classification, there is no direct relationship between the prior land classifications and the new land classifications. The USACE planning team considered the prior classifications "Recreation – High Use", and "Recreation – High Use/Interim Wildlife", to be equivalent to the current classification "High Density Recreation". The prior classification of "Recreation/Wildlife Management – Low Use" was considered equivalent to one or more of the current sub-classifications under Multiple Resource Management Lands.

Source: USACE 2019.

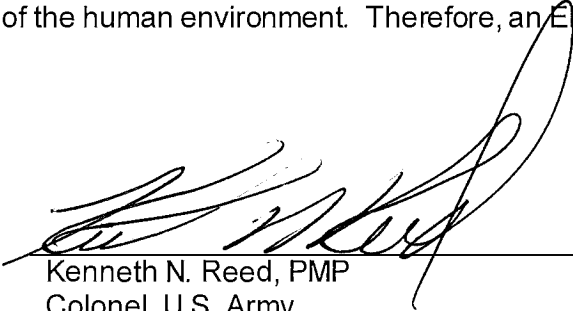
The Proposed Action was chosen because it would meet regional goals associated with good stewardship of land and water resources, would meet regional recreation goals, and would allow for continued use and development of project lands without violating national policies or public laws. In addition to the five land reclassification actions described above, the Proposed Action includes the designation of seven utility corridors strategically aligned with existing utility and road easements. The purposed of the utility corridors is to ensure that future utility lines are concentrated in select areas to conserve wildlife habitat and open space.

The EA and comments received from other agencies have been used to determine whether the Proposed Action requires the preparation of an Environmental Impact Statement (EIS). All environmental, social, and economic factors that are relevant to the recommended alternative were considered in this assessment. These include, but are not limited to, climate and climate change, environmental justice, cultural resources, air quality, visual aesthetics, prime farmland, water quality, wild and scenic rivers, wetlands, fish and wildlife, invasive species, migratory birds, recreational fisheries, and threatened and endangered species.

It is my finding, based on the EA, that the revision of the Master Plan for Joe Pool Lake will have no significant adverse impact on the environment and will not constitute a major Federal action significantly affecting the quality of the human environment. Therefore, an EIS will not be prepared.

04 APR 2019

Date



 Kenneth N. Reed, PMP
 Colonel, U.S. Army
 Commanding

ENVIRONMENTAL ASSESSMENT ORGANIZATION

This Environmental Assessment (EA) evaluates the potential environmental and socioeconomic impacts of the 2019 Joe Pool Lake Master Plan revision. This EA will facilitate the decision process regarding the Proposed Action and alternatives.

- SECTION 1 INTRODUCTION* of the Proposed Action summarizes the purpose of and need for the Proposed Action, provides relevant background information, and describes the scope of the EA.
- SECTION 2 PROPOSED ACTION AND ALTERNATIVES* examines alternatives for implementing the Proposed Action and describes the recommended alternative.
- SECTION 3 AFFECTED ENVIRONMENT* describes the existing environmental and socioeconomic setting.
- ENVIRONMENTAL CONSEQUENCES* identifies the potential environmental and socioeconomic effects of implementing the Proposed Action and alternatives.
- SECTION 4 CUMULATIVE IMPACTS* describes the impact on the environment that may result from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions.
- SECTION 5 COMPLIANCE WITH ENVIRONMENTAL LAWS* provides a listing of environmental protection statutes and other environmental requirements.
- SECTION 6 IRRETRIEVABLE AND IRREVERSIBLE COMMITMENT OF RESOURCES* identifies any irreversible and irretrievable commitments of resources that would be involved in the Proposed Action should it be implemented.
- SECTION 7 PUBLIC AND AGENCY COORDINATION* provides a listing of individuals and agencies consulted during preparation of the EA.
- SECTION 8 REFERENCES* provides bibliographical information for cited sources.
- SECTION 9 ACRONYMS/ABBREVIATIONS*
- SECTION 10 LIST OF PREPARERS* identifies persons who prepared the document and their areas of expertise.
- ATTACHMENT A NEPA COORDINATION AND PUBLIC SCOPING*

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ENVIRONMENTAL ASSESSMENT

Master Plan

Joe Pool Lake Dallas, Tarrant, and Ellis Counties, Texas

SECTION 1: INTRODUCTION

This Environmental Assessment (EA) has been prepared by the United States Army Corps of Engineers (USACE) to evaluate the proposed 2019 Joe Pool Lake Master Plan. A Master Plan is a programmatic document that is subject to evaluation under the National Environmental Policy Act (NEPA) of 1969, (Public Law [PL] 91-190). This EA is an assessment of potential impacts that could result with the implementation of either the No Action or Proposed Action and has been prepared in accordance with 33 Code of Federal Regulations (CFR) Part 230 and the Council on Environmental Quality (CEQ) Regulations (40 CFR 1500-1508), as reflected in the USACE Engineering Regulation, ER 200-2-2.

A Master Plan is a strategic land use management plan that provides direction to the orderly development, administration, maintenance, preservation, enhancement, and management of all natural, cultural and recreational resources of a USACE water resource project, which includes all government-owned lands in and around a reservoir. It is a vital tool for responsible stewardship and sustainability of the project's natural and cultural resources, as well as the provision of outdoor recreation facilities and opportunities on Federal lands associated with Joe Pool Lake for the benefit of present and future generations. A Master Plan identifies conceptual types and levels of activities, but does not include designs, project sites, or estimated costs. All actions carried out by USACE, other agencies, and individuals granted leases to USACE lands must be consistent with the Master Plan. Therefore, the Master Plan must be kept current in order to provide effective guidance in USACE decision-making. The original Joe Pool Lake Master Plan was approved in 1981 and has not been updated until this revision.

1.1 PROJECT DESCRIPTION

Joe Pool Dam is located at river mile (RM) 11.2 on Mountain Creek, a tributary to the West Fork of the Trinity River. The dam site is located in Dallas County, about 10 miles southwest of the city of Dallas and adjacent to the city of Grand Prairie. The lake extends from Dallas County into Tarrant and Ellis counties (Figure 1-1). Joe Pool Lake is located in the Mountain Creek watershed in the Upper Trinity River Basin. The headwaters of Mountain Creek begin in the northern part of Johnson County in North Central Texas and flow north and northeasterly until it joins the West Fork of the Trinity River at RM 507.8. The watershed is southwest of Dallas, Texas and comprises portions of Johnson, Ellis, Tarrant, and Dallas Counties. It is roughly 37 miles long, with a maximum width of about 16 miles, and contains total area of 304 square miles, of which 232 square miles drain into Joe Pool Lake.

Two major left-bank tributaries drain the western part of the Mountain Creek watershed. Walnut Creek joins Mountain Creek just upstream of Joe Pool Dam, while Fish Creek drains into Mountain Creek Lake, which is located roughly 7 miles downstream of Joe Pool Dam. Minor left-bank tributaries that flow into Mountain Creek are Cottonwood Creek and Lynn Creek. Minor right-bank tributaries that flow into Mountain Creek are O' Guinn Creek, Artesian Creek, John Penn Branch, Baggett Branch, and Hollings Branch. Flow between Mountain Creek Dam and

Joe Pool Dam, is affected by backwater from Mountain Creek Lake. Downstream from Mountain Creek Dam flows are affected by backwater from the West Fork of the Trinity River.

Joe Pool Lake was authorized for construction in 1965 as a multi-purpose reservoir for flood control, water conservation, recreation and fish and wildlife as contained in the River and Harbor Act of 1965 (PL 89-298), in accordance with the total plan of improvement for the Trinity River as outlined in House Document 276 (89th Congress, 1st Session). Originally known as Lakeview Lake, the name was changed on December 31, 1982 by PL 97-400 in honor of the former U.S. Congressman Joe Richard Pool from Dallas, Texas, who served in the U.S. House of Representatives from January 1963 through July 1968. Construction of Joe Pool Dam began December 6, 1979, and was completed in May 1986. Deliberate impoundment began in January 1986 and the conservation pool was filled in May 1989.

Joe Pool Dam and Lake Project is an integral part of the USACE plan for flood control and water conservation in the Trinity River Basin. The plan presently consists of eight major flood control projects, known as Benbrook Dam, Bardwell Dam, Grapevine Dam, Joe Pool Dam, Lavon Dam, Lewisville Dam, Navarro Mills Dam, and Ray Roberts Dam. The eight flood control projects in the Trinity River system control approximately 1,591,300 acre-feet of flood control area. Joe Pool controls 232 square miles of drainage area.

1.2 PURPOSE OF AND NEED FOR THE ACTION

The purpose of the Proposed Action is to ensure that the conservation and sustainability of the land, water, and recreational resources on Joe Pool Lake are in compliance with applicable environmental laws and regulations and to maintain quality lands for future public use. The 2019 Master Plan is intended to serve as a comprehensive land and recreation management plan with an effective life of approximately 25 years.

The Master Plan must be kept current in order to provide effective guidance in decision-making that responds to changing regional and local needs, resource capabilities and suitabilities, and expressed public interests consistent with authorized project purposes and pertinent legislation and regulations. The current Joe Pool Lake Master Plan is over 35 years old and does not currently reflect ecological, socio-political, and socio-demographic changes that are currently affecting Joe Pool Lake, or those changes anticipated to occur through 2043. Changes in outdoor recreation trends, regional land use, population, current legislative requirements and USACE management policy have indicated the need to revise the plan. Additionally, increasing fragmentation of wildlife habitat, national policies related to climate change and growing demand for recreational access and protection of natural resources are all factors affecting Joe Pool Lake and project's region in general. In response to these continually evolving trends, the USACE determined that a full revision of the 1981 plan is needed.

The following factors may influence reevaluation of management practices and land uses:

- Changes in national policies or public law mandates;
- Operations and maintenance budget allocations;
- Recreation area closures;
- Facility and infrastructure improvements;
- Cooperative agreements with stakeholder agencies (such as Texas Parks and Wildlife Department [TPWD] and the U.S. Fish and Wildlife Service [USFWS]) to operate and maintain public lands; and
- Evolving public concerns.

1.3 SCOPE OF THE ACTION

This EA was prepared to evaluate existing conditions and potential impacts of proposed alternatives associated with the implementation of the 2019 Master Plan. The alternative considerations were formulated with special attention given to revised land classifications, new resource management objectives, and a conceptual resource plan for each land classification category. This EA was prepared pursuant to the National Environmental Policy Act (NEPA),



Figure 1-1. Location Map

Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] 1500–1517), and the USACE implementing regulations, Policy and Procedures for Implementing NEPA, ER 200-2-2 (USACE, 1988).

The typical focus of NEPA compliance consists of environmental impact assessments for individual projects, rather than for long-range plans. However, application of NEPA to more strategic decisions not only meets the Council on Environmental Quality (CEQ) implementing regulations (CEQ 2005) and USACE regulations for implementing NEPA (USACE 1988), but also allows the USACE to consider the environmental consequences of its actions long before any physical activity is implemented. Multiple benefits can be derived from such early consideration. Effective and early NEPA integration with the master planning process can significantly increase the usefulness of the 2019 Master Plan to the decision maker.

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SECTION 2: PROPOSED ACTION AND ALTERNATIVES

The purpose and need of the proposed action is to revise the 1981 Master Plan so that it is compliant with current USACE regulations and guidance, incorporates public needs, and recognizes surrounding land use and recreational trends. As part of this process, which includes public outreach and comment, two alternatives were developed for evaluation, including a No Action Alternative and a Proposed Action Alternative. The alternatives were developed using land classifications that indicate the primary use for which project lands would be managed. USACE regulations specify five possible categories of land classification: Project Operations (PO), High Density Recreation (HDR), Mitigation, Environmentally Sensitive Areas (ESA), and Multiple Resource Managed Lands (MRML). MRML are divided into four subcategories: Low Density Recreation (MRML-LDR), Wildlife Management (MRML-WM), Vegetation Management (MRML-VM), and Inactive/Future Recreation (MRML-IFR) Areas.

USACE guidance recommends the establishment of resource goals and objectives for purposes of development, conservation, and management of natural, cultural, and man-made resources at a project. Goals describe the desired end state of overall management efforts, whereas resource objectives are specific task-oriented actions necessary to achieve the overall 2019 Master Plan goals. Goals and objectives are guidelines for obtaining maximum public benefits while minimizing adverse impacts on the environment and are developed in accordance with 1) authorized project purposes, 2) applicable laws and regulations; 3) resource capabilities and suitabilities; 4) regional needs; 5) other governmental plans and programs; and 6) expressed public desires. The five project-wide management goals established for Joe Pool Lake that were used in determining the Proposed Action, as well as the nationwide USACE Environmental Operating Principles, are discussed in detail Chapter 3: Resource Goals and Objectives of the 2019 Master Plan and are incorporated herein by reference (USACE, 2019). Specific resource objectives to accomplish these goals can be found in Chapter 3 of the 2019 Master Plan.

USACE will not address dam operations or water management of Joe Pool Lake under either the No Action or Proposed Action alternatives. Water management, which includes flood risk management and dam operations, is established in the Trinity River Basin Master Reservoir Regulation Manual and the Joe Pool Lake Water Control Manual.

2.1 ALTERNATIVE 1: NO ACTION

Under the No Action Alternative, the USACE would not approve the adoption or implementation of the 2019 MP. Instead the USACE would continue to manage Joe Pool Lake's natural resources as set forth in the 1981 Master Plan. The 1981 Master Plan would continue to provide the only source of comprehensive management guidelines and philosophy. However, the 1981 Master Plan is out of date and does not reflect the current ecological, socio-political, or socio-demographic conditions of Joe Pool Lake or those that are anticipated to occur through 2043.

The No Action Alternative, while it does not meet the purpose and need, serves as a benchmark of existing conditions against which Federal actions can be evaluated, and, therefore, is included in this EA pursuant to CEQ regulations 40 CFR § 1502.14(d).

2.2 ALTERNATIVE 2: PROPOSED ACTION

Under the Proposed Action, the USACE proposes to adopt and implement the 2019 MP, which guides and articulates USACE responsibilities pursuant to Federal laws to preserve, conserve, restore, maintain, manage, and develop the land, water, and associated resources. The 2019 MP would replace the 1981 MP and provide an up-to-date management plan that follows current Federal laws and regulations while sustaining the project's natural resources and

providing recreational opportunities for the next 25 years. The Proposed Action would meet regional goals associated with good stewardship of land, water, and recreational resources; address identified recreational trends; and allow for continued use and development of project lands without violating national policies or public laws.

The 2019 MP proposes to classify all Federal land lying above elevation 522.0 National Geodetic Vertical Datum of 1929 (NGVD29) into management classification categories. These management classification categories would allow uses of Federal property that meet the definition of the assigned category and ensure the protection of natural resources and environmental stewardship while allowing maximum public enjoyment of the lake's resources.

The proposed land classification categories are defined as follows:

- Project Operations (PO): Lands required for the dam, spillway, switchyard, levees, dikes, offices, maintenance facilities, and other areas used solely for the operation of Joe Pool Lake.
- High Density Recreation (HDR): Lands developed for the intensive recreational activities for the visiting public including day use and campgrounds. These areas could also be for commercial concessions and quasi-public development.
- Environmentally Sensitive Area (ESA): Areas where scientific, ecological, cultural, or aesthetic features have been identified.
- Multiple Resource Management Lands (MRML): Allows for the designation of a predominate use with the understanding that other compatible uses may also occur on these lands.
 - MRML Low Density Recreation (LDR): Lands with minimal development or infrastructure that support passive recreational use (primitive camping, fishing, hunting, trails, wildlife viewing, etc.).
 - MRML Wildlife Management (WM): Lands designated for stewardship of fish and wildlife resources.
 - MRML Vegetation Management (VM): Lands designated for stewardship of vegetative resources.
 - MRML Inactive/Future Recreation (IFR):
- Surface Water: Allows for surface water zones.
 - Restricted: Water areas restricted for Joe Pool Lake operations, safety, and security.
 - Designated No-Wake: Water areas to protect environmentally sensitive shoreline areas and recreational water access areas from disturbance and areas to protect public safety.
 - Fish and Wildlife Sanctuary: This water surface classification applies to areas with annual or seasonal restrictions to protect fish and wildlife species during periods of migration, resting, feeding, nesting, and/or spawning. Joe Pool Lake has no water surface areas designated as a Fish and Wildlife Sanctuary.
 - Open Recreation: Water areas available for year-round or seasonal water-based recreational use.

Table 2-1 shows the proposed classifications and acres contained in each classification, Table 2-2 shows the water surface classifications, and Table 2-3 provides the justification for the proposed reclassification.

Table 2-1. Proposed Joe Pool Lake Land Classifications

1981 Land Classifications	Acres	Proposed New Land Classifications	Acres ¹
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Operations and Maintenance	309	PO	308
Recreational Areas ²	3,236	HDR	4,043
Recreation – High Use/Interim Wildlife ²	1,756		
		ESA	1,507
Recreation/Wildlife Management – Low Use	3,360	MRML – LDR	578
		MRML – VM	157
		MRML – WM	2070
Permanent Pool	7,470 ³	Permanent Pool	6,707 ³
Total	16,131 ¹	Total	15,370 ¹
Flowage Easement	1,904	Flowage Easement	1,904

¹The new land classification acreage figures were measured using GIS technology and may vary slightly from prior classifications, and from official land acquisition records. Also, with the exception of the Project Operations classification, there is no direct relationship between the prior land classifications and the new land classifications. The USACE planning team considered the prior classifications “Recreation – High Use”, and “Recreation – High Use/Interim Wildlife”, to be equivalent to the current classification “High Density Recreation”. The prior classification of “Recreation/Wildlife Management – Low Use” was considered equivalent to one or more of the current sub-classifications under Multiple Resource Management Lands.

²Included within the acreages of Recreation High Use and Recreation High Use/Interim Wildlife is 1,475 acres of Separable Recreation Lands that were acquired for the sole purpose of Recreation.

³The 7,470 acre figure has been used as the conservation pool acreage for many years, but more refined measurements performed as part of the revision of the 1981 Master Plan indicates the conservation pool is 6,707 acres.

Table 2-2. Proposed Joe Pool Lake Surface Water Classifications

Classification	Acres
Surface Water: Restricted	24
Surface Water: Designated No-Wake	103
Surface Water: Open Recreation	6,580
Surface Water: Fish and Wildlife Sanctuary	0

Source: USACE 2019

Table 2-3. Justification for the Proposed Land Reclassifications

Proposal	Description	Justification
Project Operations (PO)	Project Operations lands were decreased from 309 acres to 308 acres from the prior classification. Lands classified as PO lands were reclassified as follows:	The 7 acre change recognizes that the uncontrolled spillway is a major operational facility and must be classified as Project Operations.

Proposal	Description	Justification
	<ul style="list-style-type: none"> ○ 7 acres surrounding the uncontrolled spillway was changed from Recreation – High Use to Project Operations ○ 10 acres of Project Operations land was changed to Environmentally Sensitive Area (ESA). 	<p>Recreational fishing at the uncontrolled spillway is an incidental use subservient to the primary purpose of the spillway. The 10 acres west of the gate control tower was changed to ESA to recognize important cultural resources.</p>
<p>High Density Recreation (HDR)</p>	<p>Most lands under the prior classifications of Recreation – High Use and Recreation – High Use/Interim Wildlife were converted to the new and similar classification of HDR, but were reduced from 4,992 acres to 4,043 acres through the following reclassifications:</p> <ul style="list-style-type: none"> ○ 7 acres at uncontrolled spillway changed to PO ○ 291 acres in Loyd Park and 512 acres of CHSP changed to ESA ○ 157 acres changed from Recreation – High Use to Vegetative Management in Cedar Hill State Park (CHSP) ○ 87 acres of Britton Park changed to Multiple Resource Management Lands (MRML) – Wildlife Management (WM) ○ 69 acres of Pleasant Valley Park changed to ESA ○ 96 acres of Recreation – High Use/Interim Wildlife in Estes Park changed to MRML-Low Density Recreation (LDR) ○ 275 acres of Recreation/Wildlife Management – Low Use changed to HDR ((area 	<p>Each of these changes were needed to recognize the following project operational needs:</p> <ul style="list-style-type: none"> ○ 7 acres changed to PO at uncontrolled spillway ○ 1,021 acres change to ESA to recognize high habitat values, important vegetation values, and cultural resource values ○ 275 acres changed to HDR to meet anticipated recreation needs in Estes and Camp Wisdom parks <p>These classification changes will have little to no effect on current or future public use.</p>

Proposal	Description	Justification
	<p>to be added to Estes Park (177-acres) and HDR portion of Camp Wisdom Park (98-acres)</p> <ul style="list-style-type: none"> ○ 5 acres of west portion of Lynn Creek Park changed to ESA 	
<p>Environmentally Sensitive Areas (ESA)</p>	<p>The classification of 1,507 acres as Environmentally Sensitive Areas resulted from the following land classification changes:</p> <ul style="list-style-type: none"> ○ 291 acres of Loyd Park and 512 acres of CHSP from Recreation – High Use to ESA. ○ 10 acres of PO lands to ESA ○ 620 acres of Recreation/Wildlife Management – Low Use to ESA ○ 69 acres of Recreation – High Use / Interim Wildlife (Pleasant Valley Park) to ESA ○ 5 acres of Recreation – High Use / Interim Wildlife (west end of Lynn Creek Park) to ESA 	<p>These classification changes were necessary to recognize those areas at the project having the highest ecological value, areas serving as filters for surface water runoff, and areas having high cultural resource values. Reclassification to ESA status will have little to no effect on current or projected public use. Lands classified as ESA are given the highest order of protection among possible land classifications. These classification changes will have little to no effect on current or future public use.</p>
<p>MRML – LDR</p>	<p>Acreege of MRML – LDR lands totals 578 acres. Approximately 482 acres of former Recreation / Wildlife Management – Low Use was reclassified as MRML – Low Density Recreation. The parcels that were changed included a 91 acre portion of undeveloped Camp Wisdom Park and five distinct additional parcels consisting primarily of narrow shoreline parcels located immediately adjacent to private property. Additionally, 96 acres of former Recreation – High</p>	<p>This classification change of 482 acres was primarily a change in nomenclature from old to new. The 96 acre change was partly in response to public comment and partly to the City of Grand Prairie’s future plans for the 96 acres. Considering the configuration of the parcels in question, as well as their historic and anticipated use, the MRML – LDR classification is the most appropriate. If a nature trail is eventually placed on the</p>

Proposal	Description	Justification
	Use/Interim Wildlife land in Estes Park was reclassified as MRML – Low Density Recreation.	96 acres as envisioned by Grand Prairie, and the area is managed as a controlled access park, passive use of the area by neighboring landowners may be curtailed.
MRML – Vegetative Management (VM)	Approximately 157 acres of former Recreation – High Use lands was reclassified to MRML - VM	This reclassification involves several distinct parcels in CHSP where Texas Parks and Wildlife Department (TPWD) is restoring native blackland prairie habitat.
MRML – WM	<p>The 2,070 acres of MRML – WM land resulted from a simple name change on 1,983 acres of former Recreation / Wildlife Management – Low Use as well as the following classification changes:</p> <ul style="list-style-type: none"> ○ 87 acres of Recreation – High Use / Interim Wildlife (north end of Britton Park) changed to MRML-WM ○ 10 acres of Recreation / Wildlife – Low Use was changed to ESA along the west end of the Lynn Creek riparian corridor ○ 482 acres of Recreation / Wildlife Management – Low Use changed to LDR ○ 114 acres of Recreation / Wildlife Management – Low Use changed to ESA (area parallel to toe of dam) ○ 289 acres of Recreation / Wildlife Management – Low 	<p>The 87-acre undeveloped northern portion of Britton Park was reclassified to MRML – WM. Ten acres of riparian corridor on the west end of Lynn Creek was reclassified as ESA. The 482 acre change to MRML - LDR was needed as explained above under the MRML-LDR classification. The 114 acre change to ESA is a parcel parallel to the western downstream toe of the dam that is needed as a visual buffer and is used for mitigation plantings. The 275 acre change to HDR was needed to properly classify Camp Wisdom Park and to make a logical addition of 177 acres to Estes Park. The 87-acre parcel below Joe Pool dam is a riparian corridor along the outlet channel. These classification changes will have little to no effect on current or future public use.</p>

Proposal	Description	Justification
	<p>Use changed to ESA (along Walnut Creek)</p> <ul style="list-style-type: none"> ○ 120 acres of Recreation / Wildlife Management – Low Use changed to ESA (Low Branch riparian corridor) ○ 275 acres of Recreation / Wildlife Management – Low Use changed to HDR (98 acres added to Camp Wisdom Park and 177 acres added to Estes Park) ● 87 acres of Recreation / Wildlife Management – Low Use Changed to ESA (along Mountain Creek below dam) 	
Utility Corridors	<p>Seven utility corridors were identified to serve as preferred locations for future outgrants such as easements for roads and utility lines on USACE lands at Joe Pool Lake. Descriptions of each corridor can be found in Section 6.1 of the 2019 Master Plan</p>	<p>Utility corridors identify areas for current and future utility use that would also limit further fragmentation of existing habitat at Joe Pool Lake.</p>
Water Surface	<p>The classification of 6,707 acres of water surface of the lake at the conservation pool elevation is as follows:</p> <ul style="list-style-type: none"> ○ 24 acres of Restricted water surface at Joe Pool Lake include the water surface in front of the intake structure at the control tower at Joe Pool Dam and designated swimming areas in Lynn Creek Park and CHSP. Buoys mark the line in front of the dam. 	<p>Restricted and Designated No-Wake areas are necessary for public safety reasons. The Water Use Plan in the 1981 Master Plan designated the upper portions of the Mountain Creek and Walnut Creek arms of the lake as a “Low Speed Boating Area”, but these area are now included in the Open Recreation classification. It is incumbent on boaters to operate their vessel safely in these uncleared areas. The classification of water</p>

Proposal	Description	Justification
	<p>Keep-out buoys and floating barrier pipes mark the designated swimming areas in each park.</p> <ul style="list-style-type: none"> ○ 103 acres of Designated No-Wake areas are in place near the 7 boat ramps, along Lakeridge Parkway bridges, and at the marina. <p>There are 6,580 acres of Open Recreation water surface at Joe Pool Lake.</p>	<p>surfaces will have no effect on current or projected public use</p>

* The land classification changes described in this table are the result of changes to several individual parcels of land ranging from a few acres to several hundred acres. Acreages were measured using geographic information system (GIS) technology. The acreage numbers provided are approximate. Source: USACE 2019

Recent USACE guidance in ER-1130-2-550, Chapter 17, encourages the establishment of designated utility corridors with defined boundaries on project lands as a means to consolidate the placement of utility lines in locations resulting in the least possible environmental impact. The Proposed Action establishes seven corridors at Joe Pool Lake (see Chapter 6.1 in the Master Plan). Each corridor is incorporating and/or running parallel to an existing easement. Future use of one or more of these shared corridors may require prior approval of those entities with previously secured legal rights to said corridor easements(s). Best Management Practices (BMPs) specify that future use of each corridor shall occur, where feasible, within existing, previously disturbed easements and secondarily within a narrow strip of land varying from 50 feet to 75 feet lying parallel to existing easements. Future underground utilizes within each corridor shall be installed, where possible, by subsurface boring. The future use of any corridor will require mitigation for the loss of any natural resources in accordance with USACE stipulations. Chapter 6.1 in the Master Plan provides a summary of corridor locations, length, and the acreage of project lands included in each corridor that is not already included within an existing easement.

2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER CONSIDERATION

Other alternatives to the Proposed Action were initially considered as part of the scoping process for this EA. However, none met the purpose of and need for the Proposed Action or the current USACE regulations and guidance. Furthermore, no other alternatives addressed public concerns. Therefore, no other alternatives are being carried forward for analysis in this EA.

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SECTION 3: AFFECTED ENVIRONMENT AND CONSEQUENCES

This section of the EA describes the natural and human environments that exist at the project and the potential impacts of the No Action and Proposed Action alternatives, outlined in Section 2 of this document. Only those issues that have the potential to be affected by any of the alternatives are described, per CEQ guidance (40 CFR § 1501.7 [3]). Some topics are limited in scope due to the lack of direct effect from the Proposed Action on the resource or because that particular resource is not located within the project area. For example, no body of water in the Joe Pool Lake watershed is designated as a Federally Wild or Scenic River, so this resource will not be discussed.

Impacts (consequence or effect) can be either beneficial or adverse and can be either directly related to the action or indirectly caused by the action. Direct effects are caused by the action and occur at the same time and place (40 CFR § 1508.8 [a]). Indirect effects are caused by the action and are later in time or further removed in distance but are still reasonably foreseeable (40 CFR § 1508.8 [b]). As discussed in this section, the alternatives may create temporary (less than 1 year), short-term (up to 3 years), long-term (3 to 10 years following the master plan revision), or permanent effects.

Whether an impact is significant depends on the context in which the impact occurs and the intensity of the impact (40 CFR § 1508.27). The context refers to the setting in which the impact occurs and may include society as a whole, the affected region, the affected interests, and the locality. Impacts on each resource can vary in degree or magnitude from a slightly noticeable change to a total change in the environment. For the purpose of this analysis, the intensity of impacts would be classified as negligible, minor, moderate, or major. The intensity thresholds are defined as follows:

- Negligible: A resource would not be affected or the effects would be at or below the level of detection, and changes would not be of any measurable or perceptible consequence.
- Minor: Effects on a resource would be detectable, although the effects would be localized, small, and of little consequence to the sustainability of the resource. Mitigation measures, if needed to offset adverse effects, would be simple and achievable.
- Moderate: Effects on a resource would be readily detectable, long-term, localized, and measurable. Mitigation measures, if needed to offset adverse effects, would be extensive and likely achievable.
- Major: Effects on a resource would be obvious and long-term, and would have substantial consequences on a regional scale. Mitigation measures to offset the adverse effects would be required and extensive, and success of the mitigation measures would not be guaranteed.

3.1 LAND USE

Joe Pool Lake was originally authorized by the River and Harbor Act of 1965. Construction of the Joe Pool Lake Dam and Lake (formerly Lakeview Reservoir) began in December 1979 and was completed in May 1986. Real estate acquisition records show the total project area at Joe Pool Lake encompasses 16,971 acres. Of this total area, 15,067 acres were acquired in fee simple title by USACE, while a total of 1,904 acres were acquired for a perpetual Flowage Easement. When the pool elevation is at the normal or conservation pool elevation of 522.0 NGVD29, the lake has a surface area of 6,707 acres based on the refined measurements developed using geographical information systems (GIS) technology for the 2019 MP.

The USACE lands presently associated with Joe Pool Lake are listed in the 1981 MP as follows:

- 309 acres of land managed as operations and maintenance
- 3,236 acres of land managed as high use recreational areas; of which:
 - 1,756 acres of land is managed as recreation – High Use/Interim Wildlife Management, and
- 3,360 acres of land managed as Recreation/Wildlife Management – Low Use

USACE has a limited role in directly managing outdoor recreation at Joe Pool Lake. This role consists of managing pedestrian use of the road across the top of the dam, fishing use adjacent to the stilling basin area and along Mountain Creek below the dam, cooperative management of the water surface as it relates to boating activity, and managing general pedestrian access to lands that are not leased to non-federal entities.

USACE does not operate or manage any of the designated HDR areas at Joe Pool Lake. The HDR areas are leased to non-Federal partners. In the case of Joe Pool Lake, the major lessees are the City of Grand Prairie and TPWD. TPWD has one large parcel under lease and the City of Grand Prairie has seven distinct areas under lease. The non-Federal lessees are responsible for the operation and maintenance of their leased areas; USACE does not provide direct maintenance within any of the leased locations, but it may occasionally lend support where appropriate. The USACE reviews requests and ensures compliance with applicable laws and regulations for proposed activities in all leased High Density Recreation areas. The high density recreation areas have been broken down into those leased to TPWD – Cedar Hill State Park and those leased to the City of Grand Prairie – Loyd, Lynn Creek, and Britton parks and four undeveloped park areas. The following is a description of each park:

Cedar Hill State Park (CHSP) – Located on the east side of Joe Pool Lake between the Dam and the City of Cedar Hill, Cedar Hill State Park covers approximately 1,943 acres. The northeastern half of the park is highly developed with campsites, day use facilities, and the Penn Farm Agricultural History Center. The southwestern half is largely undeveloped, but is crisscrossed by three off-road bicycle trails. CHSP is one of the largest and most heavily used state parks in the Texas state park system. Park amenities include 30 walk-in campsites, 200 campsites with water and electric service, 150 campsites with water, electric and sewer hook-ups, hike and bike trails, swimming beach, picnic tables, 1 picnic pavilion (group shelter), and 2 boat ramps. Cedar Hill State Park also manages the Overlook at Joe Pool Dam, which has trail heads and restrooms, and provides an overview of Joe Pool Lake.

Loyd Park – Located on the west shore of Joe Pool Lake, Loyd Park covers about 791 acres of native Texas landscape. Park amenities include private campsites with water electric service; several cabins; a 4-lane boat ramp; boat dock; swimming beach; hike and bike trails; kayak and canoe rentals; golf cart and bicycle rentals; camp store; a lodge with 15 bedrooms, a full kitchen and a meeting room; and 2 picnic pavilions (group shelters).

Lynn Creek Park – Located on the northwest shore of Joe Pool Lake, this park covers about 778 acres. Park amenities include a swimming beach, playground, restrooms, showers, two boat ramps with 4-lanes each, a concession stand, almost 100 picnic sites, 2 group picnic pavilions, and a sand volleyball court. Also present in the park is a city-operated fire and police station and a small city office complex. This type of city infrastructure is generally not allowed in park areas, but authorization was granted as part of the lease transfer from the Trinity River Authority (TRA) to the City of Grand Prairie.

- Lynn Creek Marina – Located within Lynn Creek Park and contains 514 wet slips, 40 dry storage slips, a ships store and service center, and “the Oasis”, a 450 seat restaurant.

Britton Park – Britton Park is a self-pay park roughly 115 acres that serves as a boat ramp location in the upper end of the Mountain Creek arm of Joe Pool Lake. The ramp has two lanes and the park is open to bank fishing.

Undeveloped Parks

The four undeveloped parks currently leased to the City of Grand Prairie include Camp Wisdom Park, Estes Park, Low Branch Park, and Pleasant Valley Park. Each of these parks are described as follows:

Camp Wisdom Park: This 186-acre undeveloped park is located downstream of the dam. The City of Grand Prairie has expressed interest in expanding the acreage of this park to include USACE land located southeast of the current park boundary up to the FM 1382 and the access road leading to the USACE lake office. Proposed park amenities may include an equestrian facility, along with equestrian related retail support facilities to provide a wide range of goods and services to park users. Also proposed is a multi-field athletic complex, which may include development of a youth and adult sports field complex consisting of baseball fields, softball fields, soccer fields, volleyball, and multipurpose courts and associated support facilities. It should be noted that organized sports athletic fields and facilities are contrary to current USACE policy and would not be approved

Estes Park: Estes Park has been slated for development of a comprehensive resort facility dating back to the original 1981 Master Plan. The City of Grand Prairie is currently soliciting proposals from developers to place a comprehensive resort on the peninsula. Earlier attempts to develop Estes Park, first by TRA and then by Grand Prairie were not successful, but the city is hopeful that current socioeconomic conditions will bring success. The park originally encompassed 1,057 acres and is expanded to 1,138 acres by land classification changes made as part of the revisions proposed in the 2019 MP. The city has expressed interest in amending their current lease to include the additional acres added by revision of the MP.

Low Branch Park: This roughly 129-acre park is located on the west side of the Mountain Creek arm of the lake. The city has no immediate plans to develop the park. Fifteen acres of this park is currently being utilized as a radio control aircraft field.

Pleasant Valley Park: This 265-acre park is located on the east side of the Mountain Creek arm of the lake. The city’s 2016 master plan calls for the park to be developed within the plan’s 10-year planning horizon to have a neighborhood park atmosphere with some level of typical lakeside development.

3.1.1 Alternative 1: No Action

The No Action Alternative for Joe Pool Lake is defined as the USACE taking no action, which means the MP would not be revised. No new resources analysis, resources management objectives, or land-use classifications would occur. The operation and maintenance of USACE lands at Joe Pool Lake would continue as outlined in the existing MP. Although this alternative does not result in a MP that meets current regulations and guidance, there would be no significant impacts on land uses on Joe Pool Lake lands.

3.1.2 Alternative 2: Proposed Action

The objectives for revising the Joe Pool Lake MP were to describe current and foreseeable land uses, taking into account expressed public opinion, regional trends, and USACE policies

that have evolved to meet day-to-day operational needs. The USACE intends to continue to lease recreation lands at Joe Pool Lake to non-federal partners, who are anticipated to maintain and improve existing facilities with potential plans for future expansion.

The changes required for the Proposed Action were developed to help fulfill regional goals associated with good stewardship of land and water resources that would allow for continued use and development of project lands. With the combination of continued HDR and LDR land classifications along with ESAs, VM, and WM coupled with the designation of utility corridors, land use changes are expected to be minimal at Joe Pool Lake. The designation of utility corridors, as described in Section 6.2 of the 2019 master Plan, will serve to avoid and minimize impacts of fragmentation on the proposed land uses. Utility corridors provide areas for existing and future infrastructure while minimizing the extent of reoccurring maintenance activities and additional habitat fragmentation. Therefore, implementation of the Proposed Action would not result in significant impacts on land uses on project lands.

3.2 WATER RESOURCES

Surface Water

Joe Pool Lake is located in the Mountain Creek watershed in the Upper Trinity River Basin. The headwaters of Mountain Creek begin in the northern part of Johnson County in North Central Texas and flow north and northeasterly until it joins the West Fork of the Trinity River at RM 507.8. The watershed is southwest of Dallas, Texas and comprises portions of Johnson, Ellis, Tarrant, and Dallas Counties. It is roughly 37 miles long, with a maximum width of about 16 miles, and contains a total area of 304 square miles, of which 232 square miles drain into Joe Pool Lake.

Two major left-bank tributaries drain the western part of the Mountain Creek watershed. Walnut Creek joins Mountain Creek just upstream of Joe Pool Dam, while Fish Creek drains into Mountain Creek Lake, which is located roughly 7 miles downstream of Joe Pool Dam. Minor left-bank tributaries that flow into Mountain Creek are Cottonwood Creek and Lynn Creek. Minor right-bank tributaries that flow into Mountain Creek are O' Guinn Creek, Artesian Creek, John Penn Branch, Baggett Branch, and Hollings Branch. Numerous additional intermittent and ephemeral streams feed into the major and minor tributaries of the watershed as well as into Joe Pool Lake.

Wetlands

Waters of the United States are defined within the Clean Water Act (CWA), and jurisdiction is addressed by the USACE and United States Environmental Protection Agency (USEPA). Wetlands are a subset of the waters of the United States that may be subject to regulation under Section 404 of the CWA (40 CFR 230.3). Wetlands are those areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Typically, the National Wetlands Inventory (NWI) established by U.S. Fish and Wildlife Service (USFWS) is used to identify wetland types in a project area. However, the available dataset for the Joe Pool project area was mapped prior to impoundment and does not reflect the current conditions. Therefore, NWI was not used to identify and calculate wetland acreage with the fee boundary of the project. Instead, the Ecological Mapping System (EMS) developed by TPWD was used. Using the TPWD's EMS mapping, wetlands are delineated as swamps and the lake is shown as open water. Table 3-1 provides the acres of open water and swamp habitats and Figure 3-1 displays the ecological habitat types at Joe Pool Lake based on EMS.

Table 3-1. Total Acres of Wetland and Open Water at Joe Pool Lake

Wetland Type	EMS Acres
Open Water	6,582.93*
Swamp (Wetland)	18.65
TOTAL ACRES of Water Resources	6,601.58

Source: TPWD 2018

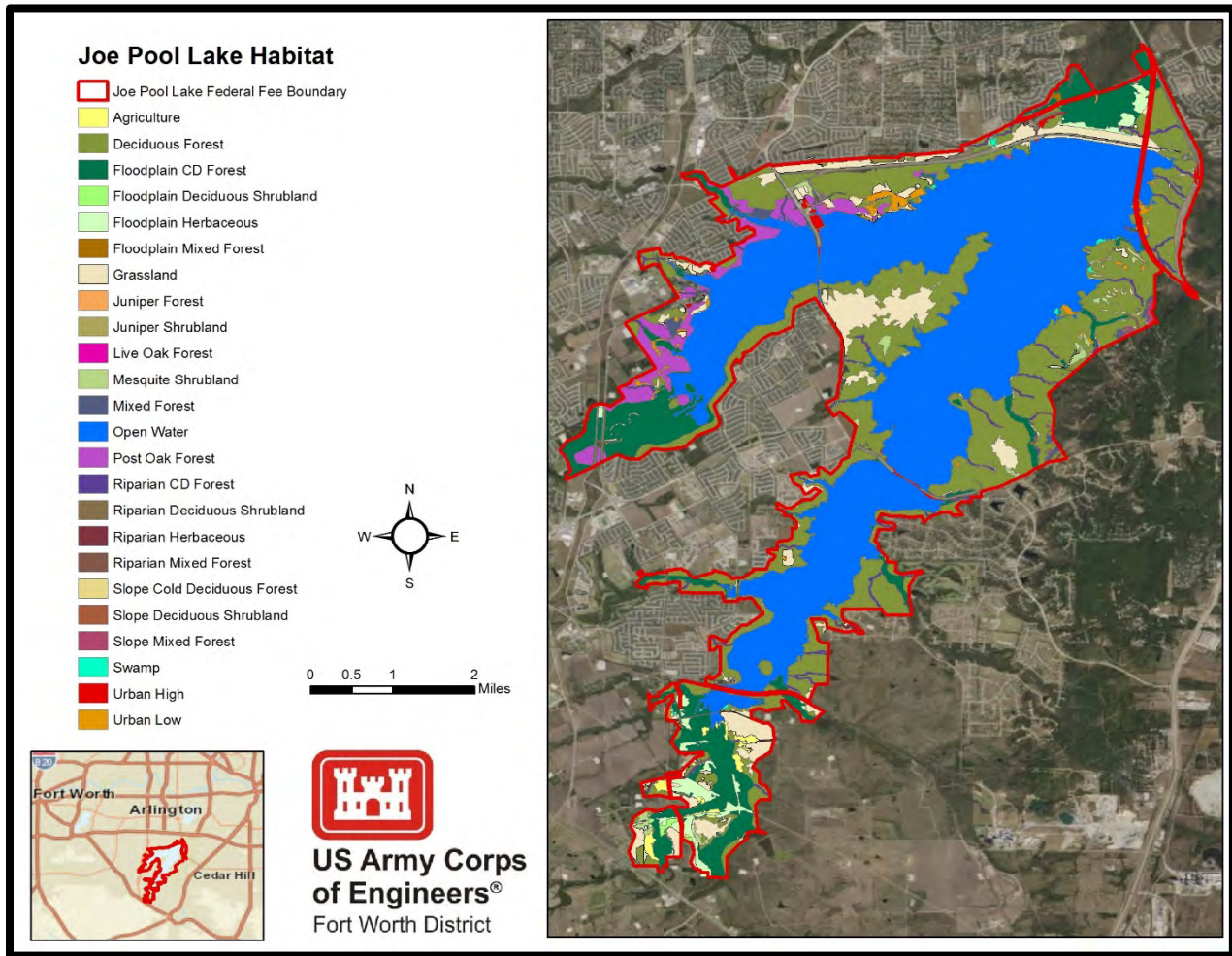


Figure 3-1. Ecological Habitat Types at Joe Pool Lake

Source: TPWD, 2018

Groundwater

Deep below Joe Pool Lake lies the Trinity and Woodbine aquifers. The Trinity Aquifer extends across much of the central and northeastern portion of Texas. This major aquifer is

composed of several smaller aquifers contained within the Trinity Group including: the Antlers, Glen Rose, Paluxy, Twin Mountains, Travis Peak, Hensell, and Hosston. The Paluxy and Twin Mountains aquifers of the Trinity Group occur within the Study Area. The Paluxy Aquifer is composed of sandstone, mudstone, and limestone, and the Twin Mountains Aquifer consists of sand with interbedded clay, limestone, dolomite, and gravel. Their combined freshwater saturated thickness averages about 600 feet in North Texas.

The Trinity Aquifer is one of the most extensive and highly used groundwater resources in Texas. Although its primary use is for municipalities, it is also used for irrigation, livestock, and other domestic purposes. Some of the state's largest water level declines, ranging from 350 to more than 1,000 feet, have occurred in counties along the Interstate 35 corridor from McLennan County to Grayson County. These declines are primarily attributed to municipal pumping, but they have slowed over the past decade as a result of increasing reliance on surface water.

The Woodbine is a minor aquifer located in northeast Texas. The aquifer overlies the Trinity Aquifer and consists of sandstone interbedded with shale and clay that form three distinct water-bearing zones. The Woodbine Aquifer reaches 600 feet in thickness in subsurface areas and serves as a water supply resource to the region. Historically, abundant springs and seeps were documented along with artesian pressures as early as the late 1800s by the first drillers to penetrate the Eagle Ford Shale and encounter the Woodbine. Wells drilled throughout the region were free flowing at hundreds of gallons per minute (gpm) for many years until increased groundwater withdrawal reduced artesian conditions. After the construction of multiple surface water reservoirs, and increased surface water supply options, the reduced use of groundwater has resulted in a partial return of higher water levels and artesian pressures in the Woodbine. The Woodbine is confined to semi-confined beneath the Eagle Ford Shale.

Hydrology

The Mountain Creek sub-watershed is subject to three general types of flood-producing rainfall events: thunderstorms, frontal rainfall, and tropical cyclones. The topography, soils, and typical rainfall patterns of the watershed lead to rapid and sharp crested flood hydrographs. Floods occur frequently and can occur at any time of year. Generally, the highest 24-hour and monthly precipitation periods have occurred during major thunderstorm events. However, there are some instances where heavy precipitation results from localized thunderstorms or rain events.

Joe Pool Dam and Lake are an integral part of the USACE plan for flood control and water conservation in the Trinity River Basin. The plan presently consists of eight major USACE flood control projects - Benbrook Dam, Bardwell Dam, Grapevine Dam, Joe Pool Dam, Lavon Dam, Lewisville Dam, Navarro Mills Dam, and Ray Roberts Dam. The eight USACE dam projects in the Trinity River system work in concert to control approximately 1,591,300 acre-feet (ac-ft) of flood control area. Specifically, Joe Pool Lake has a flood control pool capable of storing 304,000 ac-ft between elevation 522.0 and 536.0 NGVD29. Once the water elevation reaches 541.0 NGVD29 and fills an additional 362,700 ac-ft of storage space, water overtops the spillway and is uncontrollably released downstream. The pool of record occurred on May 30, 2015 with an elevation of 538.03 NGVD29.

Water Quality

Existing water quality is affected by rainfall and associated stormwater flows originating from residential, commercial, and industrial point and nonpoint sources from properties upstream and downstream of the dam and reservoir. These stormwater flows have increased over time as a result of increased urbanization and development.

TCEQ sets and implements standards for surface water quality to improve and maintain the quality of water in the state based on various beneficial use categories for the water body. The

Texas Integrated Report of Surface Water Quality, which is a requirement of the federal Clean Water Act Sections 305(b) and 303(d), evaluates the quality of surface waters in Texas and identifies those that do not meet uses and criteria defined in the Texas Surface Water Quality Standards (TSWQS). The Texas Integrated Report describes the status of Texas' natural waters based on historical data and assigns waterways to various categories depending on the extent to which they attain the TSWQS.

Water bodies are divided into and evaluated by defined, classified segments. Assessment of each beneficial use for each classified segment is accomplished by applying several assessment methods. These methods often have several criteria or screening levels that are used to evaluate assessment parameters. Use attainment assessment methods are used to determine use support and concerns for near-nonattainment. Water quality concerns are determined based on a defined amount of exceedance of screening levels and potential lack of information in data sets used to evaluate various parameters.

According to the 2014 Texas Integrated Report of Surface Water Quality, all segments located within the Study Area (3-2) are classified as Category 2. Category 2 is defined as: some standards are attained; no evidence that nonattainment of any standard will occur in the near future; and insufficient or no data and information are available to determine if the remaining standards are attained (TCEQ 2015).

The 2014 Texas Integrated Report Water Bodies with Concerns for Use Attainment and Screening Levels identifies two of the six segments within the project as having some level of concern for various parameters. Of the two concerns, one segment (0838C Walnut Creek) is listed as a 5b impaired water on the 2014 Texas 303(d) List (TCEQ 2015). This segment was first listed in 2006 for bacteria (*E. coli*). A 5b listing indicates that a review of the standards for one or more parameters, in this case bacteria, will be conducted before a management strategy is selected, including the possible revision of the TSWQS. Table 3-2 provides a listing of parameters of concern by water body segment within the Study Area.

Table 3-2. Water Body Segments within the Study Area Identified in the 2014 Texas Integrated Report of Surface Water Quality

Water Body Segment	Location	Parameter of Concern	Level of Concern*	Water Body Use of Concern
0838 – Joe Pool Lake	From Joe Pool Dam in Dallas County up to the normal pool elevation of 522 feet (impounds Mountain Creek)	Nitrate	CS	General
0838A – Mountain Creek	Ten mile stretch of Mountain Creek running upstream from US 287 in Ellis Co., to confluence with Fish Spring Branch in Johnson County.	All parameters are fully supporting (FS), no concern (NC), or not assessed (NA) for the water body use.		
0838B – Sugar Creek	A 1.6 mile stretch of Sugar Creek running upstream from Tarrant/Dallas County line, to just upstream of Britton Road in Mansfield, Tarrant County.	All parameters are fully supporting (FS), no concern (NC), or not assessed (NA) for the water body use.		
0838C – Walnut Creek	From the confluence with Joe Pool Lake up to the headwaters at Spring Street in Burleson.	E. Coli	NS	Recreation

Water Body Segment	Location	Parameter of Concern	Level of Concern*	Water Body Use of Concern
0838D – Hollings Branch	Hollings Branch from the confluence of the Mountain Creek arm of Joe Pool Lake upstream to the headwater 500 m downstream of US 67 in Midlothian	All parameters are fully supporting (FS), no concern (NC), or not assessed (NA) for the water body use.		
0838E – Soap Creek	Soap Creek from the confluence of the Mountain Creek arm of Joe Pool Lake upstream to the headwater 6.6 km (3.98 miles) upstream of Midlothian	All parameters are fully supporting (FS), no concern (NC), or not assessed (NA) for the water body use.		

Notes: * CS = Concern - screening levels indicate marginal water quality for parameter by concern assessment methods; NS = Not supporting use.

The Texas Department of State Health Services (DSHS) Seafood and Aquatic Life Group purpose is to address and prevent/reduce any disease causing agent from occurring that can be transferred from aquatic life to humans within the State of Texas. As of January 2018, no fish consumption advisories have been issued for Joe Pool Lake or the Trinity River within the Joe Pool Lake Federal Fee Boundary by the Texas (DSHS 2018).

Groundwater

In general, groundwater quality in the Trinity Aquifer is fresh but very hard in the outcrop. Total dissolved solids (TDS) increase from less than 1,000 milligrams per liter in the east and southeast to between 1,000 and 5,000 milligrams per liter, or slightly to moderately saline, as the depth of the aquifer increases. Sulfate and chloride concentrations also tend to increase with depth.

The lower zones of the Woodbine aquifer typically yield the most water, whereas the upper zone yields limited water that tends to be very high in iron. In general, water to a depth of 1,500 feet is fresh, containing less than 1,000 milligrams per liter of TDS. Water at depths below 1,500 feet is slightly to moderately saline, containing from 1,000 to 4,000 milligrams per liter of TDS.

3.2.1 Alternative 1: No Action

There would be no impacts on water resources as a result of implementing the No Action Alternative, since there would be no change to the existing Master Plan.

3.2.2 Alternative 2: Proposed Action

The reclassifications and resource management objectives required for the Proposed Action would allow land management and land uses to be compatible with the goals of good stewardship of water resources (e.g., conservation of emergent wetlands, erosion control, and maintaining good water quality). Furthermore, the utility corridors were designated to avoid and minimize impacts on water resources by future actions by requiring future actions to bore under streams and wetlands. Therefore, there would be no significant adverse impacts on water resources.

3.3 CLIMATE

Joe Pool Lake lies in the north central part of the state of Texas. The region has a warm, temperate, continental climate with cool winters and hot humid summers. Tropical maritime air masses from the Gulf of Mexico play a dominant role in the climate from late spring through early fall, while polar air masses determine the winter climate. The mean annual temperature as measured at Joe Pool Lake is 69.2 degrees (°) Fahrenheit (F) between 1984 and 2017. The

average January minimum temperature is 29.6°F and the average August maximum temperature is 102.8°F. The record low at Joe Pool Lake was -8°F and the record high was 113°F. The growing season (freeze-free period) is approximately 247 days, but can vary significantly from year to year.

Annual precipitation averages roughly 36 inches per year, with precipitation levels generally higher in the late-spring, early-summer months, peaking in May-June and lowest in November-February. Minor accumulations of snowfall occur periodically during the winter months; however snowfall does not contribute significantly to area precipitation or runoff. A large part of the annual precipitation results from thunderstorm activity, with occasional very heavy rainfall over a brief period. Thunderstorms occur throughout the year, but are more frequent in the late spring and early summer. The major storms are from frontal-type storms that generally occur in the spring and summer months, but major flooding can also be produced by intense rainfall associated with localized thunderstorms.

The relative humidity typically ranges from 35% to 91% over the course of a year, rarely dropping below 20% and reaching as high as 100%. The air is driest around the end of July/early August timeframe and is most humid around early May, exceeding 87% three days out of four. The average annual evaporation rate at Joe Pool Lake, as calculated using the measured pan evaporation multiplied by the monthly pan coefficient, is about 54 inches with the lowest evaporations rates occurring during the winter and greatest evaporation occurring during the summer.

Predicted Climate Change

The U.S. Global Change Research Program (USGCRP) looks at potential impacts of climate change globally, nationally, regionally, and by resource (e.g., water resources, ecosystems, human health). Joe Pool Lake is within the Great Plains region of analysis. The Great Plains region has already seen evidence of climate change in the form of rising temperatures that are leading to increased demand for water and energy and impacts on agricultural practices. Over the last few decades, the Great Plains have seen fewer cold days and more hot days, as well as an overall increase in total precipitation. The decrease in the cold days has resulted in an overall shortening of the frost-free season by one to two weeks. Within this region, there has been an increase in average temperatures 1.5°F from a 1960-1970 baseline to the year 2000 (USGCRP 2014). In addition to more extreme rainfall, extreme heat events have also been increasing. Most of the increases of heat wave severity in the U.S. are likely due to human activity, with a detectable human influence in recent heat waves in the southern Great Plains (USGCRP 2014). In particular, in 2011, the State of Texas experienced a heat wave and drought. The growing season and summer were both the hottest and driest on record. Extreme heat events in Texas have also been occurring substantially more frequently.

This trend of rising temperatures and more frequent extreme events such as heat waves, drought, and heavy rainfall is predicted to continue into the future (USGCRP 2014). The USGCRP looks at two potential future conditions as part of its predictive modeling process. Under conditions of lower greenhouse gas (GHG) emissions, the average temperature in the Great Plains region may increase as much as 4°F by 2020, 6°F by 2050, and 8°F by 2090 from averages observed in 2000. Under conditions of higher continuous GHG emissions, the potential increase is greater in the long-term, and may be as much as 13.5°F by 2090.

3.3.1 Alternative 1: No Action

The No Action Alternative would not result in any change in management of Joe Pool project land. Implementation of the 1981 MP would have no impact (beneficial or adverse) on existing or future climate conditions. Current policy (Executive Orders [EO] 13693 and 13783, and

related USACE policy) requires project lands and recreational programs be managed in a way that advances broad national climate change mitigation goals including, but not limited to, climate change resilience and carbon sequestration. These policies would continue to be implemented under this alternative.

3.3.2 Alternative 2: Proposed Action

The 2019 MP does not recommend any activities that would result in a change (beneficial or adverse) in GHG emissions; therefore adoption and implementation of the Joe Pool Lake MP would have no impact on the existing climate of the study area nor would it exacerbate future climate conditions. Management under the 2019 MP would also follow current policy to meet climate change goals as described for the No Action Alternative. Ground disturbing activities that arise from guidance from this document would go through the NEPA and design process prior to implementation. It is during that time, that impacts to the climate would be analyzed for those ground disturbing activities.

3.4 AIR QUALITY

The U.S. Environmental Protection Agency (USEPA) established nationwide air quality standards to protect public health and welfare in 1971. The State of Texas has adopted the National Ambient Air Quality Standards (NAAQS) as the state's air quality criteria. NAAQS standards specify maximum permissible short- and long-term and concentrations of various air contaminants including primary and secondary standards for six criteria pollutants: Ozone (O₃), Carbon Monoxide (CO), Sulfur Dioxide (SO₂), Nitrogen Oxide (NO), particulate matter (PM₁₀ and PM_{2.5}), and Lead (Pb). If the concentrations of one or more criteria pollutants in a geographic area is found to exceed the regulated "threshold" level for one or more of the NAAQS, the area may be classified as a non-attainment area. Areas with concentrations that are below the established NAAQS levels are considered either attainment or unclassifiable areas.

Joe Pool Lake is located within the Metropolitan Dallas-Fort Worth (DFW) Air Quality Control Region (AQCR). The DFW AQCR is in attainment for all criteria air pollutants, except for O₃. The DFW non-attainment area includes 10 counties (Collin, Dallas, Denton, Ellis, Johnston, Kaufman, Parker, Rockwell, Tarrant, and Wise counties) being designated nonattainment and classified as moderate under the 2008 eight-hour ozone NAAQS. The attainment deadline for the DFW moderate non-attainment area is July 20, 2018 with a 2017 attainment year.

Emissions in the DFW non-attainment area come from a variety of stationary and mobile sources. Approximately 70% of the region's air pollution comes from mobile sources such as cars, trucks, airplanes, construction equipment, and lawn equipment. The majority of pollutants emitted from motor vehicles include VOCs, NO_x, CO, PM₁₀, and PM_{2.5}. The largest regional sources of VOCs and NO_x emissions, those that contribute most to ozone levels, are non-road vehicles (construction equipment, airplanes, and locomotive) and on-road vehicles (cars and trucks) (TCEQ 2011).

3.4.1 Alternative 1: No Action

Implementation of the No Action Alternative would not result in any change to air quality in the region. The 1981 MP would remain compliant with the Clean Air Act because the MP includes only guidelines and does not incorporate actions which produce criteria pollutants.

3.4.2 Alternative 2: Proposed Action

As with the No Action Alternative, the 2019 MP would not result in any change to air quality in the region. The 2019 MP does not propose any actions (i.e. ground disturbing activities) that directly or indirectly produce criteria pollutants (i.e. total emissions is 0); therefore, this action is

compliant with the Clean Air Act and State Implementation Plan and is not subject to a conformity determination because the total emissions are below *de minimus*.

3.5 TOPOGRAPHY, GEOLOGY, AND SOILS

Topography

The topography of the lands surrounding Joe Pool Lake consists of nearly flat plains to gently rolling hills with a few shallow tributary valleys and broad pastures. Mountain Creek drops from an elevation of about 760 feet NGVD29 at its source to 456 feet NGVD29 at the base of Joe Pool Dam. The creek continues towards its confluence with the West Fork where the elevation drops further to 390 feet NDVD29. To the east of the lake, a high Austin Chalk limestone bluff protrudes a couple hundred feet above the Mountain Creek river channel. The highest parts of the bluff range in elevation from 750 to 850 feet NGVD29, which is the highest point for miles in any direction. Much of the original rolling hill topography has been modified throughout the region for agriculture and urban development.

Geology

Joe Pool Lake is located in the Gulf Coastal Plain physiographic province at the eastern edge of the Eagle Ford Prairie sub-province. The regional geology reflects the various depositional phases and environments that took place during three periods of pre-historical geologic times. The geology around Joe Pool Lake is primarily composed of three named geologic formations: Alluvium, Fluvatile Terrace Deposits, and Eagle Ford Group. See Figure 2 in Section 2.1.3 of the 2019 MP. The oldest shale and limestone layers were laid down during the Cretaceous Period, while the gravel, clay, sand, and silt were laid down periodically since the Cretaceous Period.

The Alluvium formation is composed mostly of alluvial sedimentary deposits from local creeks consisting of indistinct low terrace deposits of gravel, sand, silt, silty clay, and various forms of organic matter that were formed during the Quaternary Period. Fluvatile Terrace Deposits were also formed during the Quaternary Period and consist of mostly gravel, sand, silt, and clay terrace deposits ranging in thickness from 3 to 55 feet that overlie the Eagle Ford formation in the valley near the lake. The Eagle Ford Group is a bedrock layer comprised of mainly Upper Cretaceous clay shales of the Eagle Ford formation and has a maximum thickness at Joe Pool Dam of 225 feet.

Soils

The main soil series around Joe Pool Lake is the Houston Black Series which is very thick and normally found on level to slightly sloping areas, is slowly permeable, and contains dark, fine, sticky clay. The highly expansive clays are classified as Vertisols, which shrink and swell with changes in moisture content. As the soil swells it becomes less permeable, leading to ponding in level areas and increased runoff where there is a slope. When dry, the soil can develop deep fissures due to the shrinkage. The soil often holds many nutrients for plants including calcium, magnesium, and potassium. While Houston Black soil originally contained native prairie vegetation, Houston Black soil has been used to grow sorghum, cotton, corn, grains, and forage grasses.

The Natural Resource Conservation Service (NRCS) Web Soil Survey (2018) reports 36 soil types occurring within the Joe Pool Lake project land boundary. Table 3-3 shows the acreage associated with each soil type in the project area. Figure 3-2 shows the location of each soil type.

Table 3-3. Total Acres of Soil Types on Joe Pool Lake Project Lands

Soil Type	Number of Acres
Altoga silty clay	98.06
Altoga silty clay loam	110.12
Altoga soils	26.36
Arents	10.15
Austin-Lewisville complex	1.33
Axtell fine sandy loam	6.00
Bastsil fine sandy loam	299.44
Branyon clay	666.57
Burleson clay	10.49
Chatt silty clay	41.27
Crockett fine sandy loam	243.02
Crosstell fine sandy loam	2.62
Eddy clay loam	1.16
Eddy-Whitewright complex	34.09
Ellis and Heiden clay	79.12
Ferris clay	194.52
Ferris-Heiden complex	901.18
Frio silt clay	49.58
Gravel pits	3.04
Gullied land	11.77
Heiden and Ellis clays	1.50
Heiden clay	1,274.07
Heiden-Ferris complex	14.25
Houston Black clay	655.62
Lewisville silty clay	247.42
Navo clay loam	233.37
Normangee clay loam	3.05
Ovan clay	531.83
Pulexas fine sandy loam	194.37
Silawa fine sandy loam	405.43
Sunev clay loam	91.98
Trinity clay	750.94
Vertel clay	811.77
Whitesboro loam	280.51
Whitewright loam	65.69
Wilson clay loam	348.02
Total	15,286.98

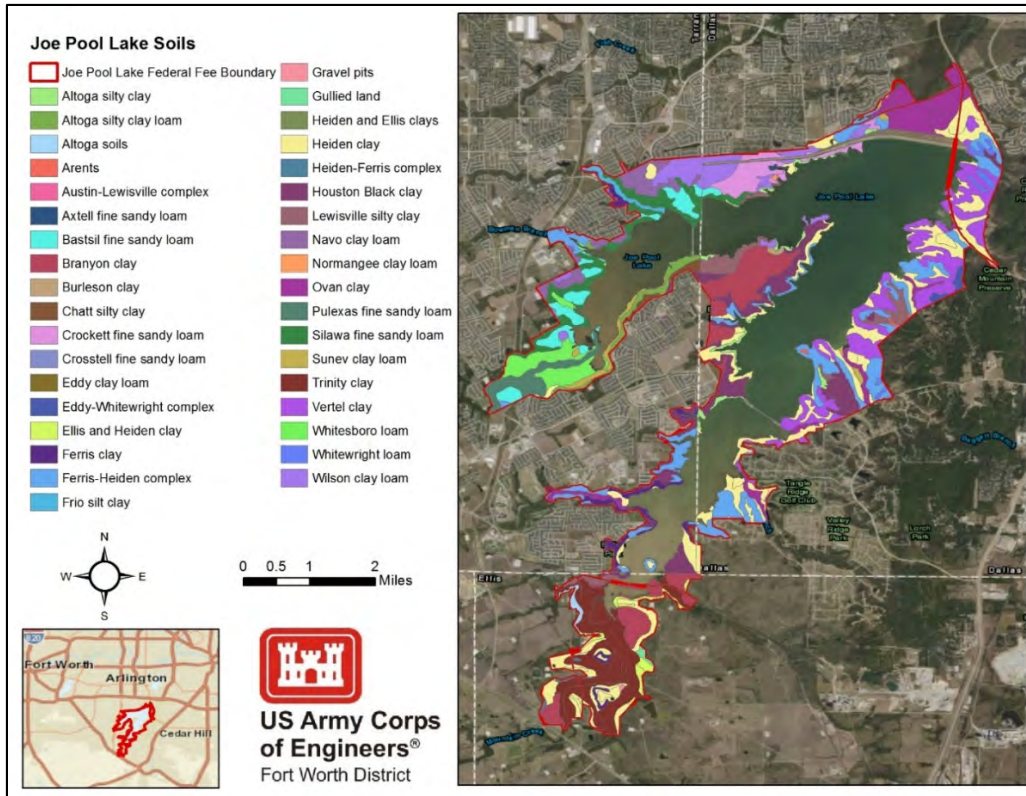


Figure 3-2. Soil Types on Joe Pool Lake Project Lands

Prime Farmland

As required by Section 1541(b) of the Farmland Protection Policy Act (FPPA) of 1980 and 1995, 7 U.S.C. 4202(b), federal and state agencies, as well as projects funded with federal funds, are required to (a) use the criteria to identify and take into account the adverse effects of their programs on the preservation of farmland, (b) consider alternative actions, as appropriate, that could lessen adverse effects, and (c) ensure that their programs, to the extent practicable, are compatible with state and units of local government and private programs and policies to protect farmland.

There are several soil types in the study area that are considered prime farmland soils or soils associated with farmlands of state importance. However, the lands represented by these soil types have not been used for farming since the lands were acquired prior to the initiation of construction of Joe Pool Reservoir in December 1979.

3.5.1 Alternative 1: No Action

The No Action Alternative does not involve any activities that would contribute to changes in existing conditions, so there would be no short- or long-term, minor, moderate, or major, beneficial, or adverse impacts on topography, geology, soils, or prime farmland as a result of implementing the No Action Alternative.

3.5.2 Alternative 2: Proposed Action

Topography, geology, and soils were considered during the refining process of land reclassifications for the 2019 MP. Some lands under the prior classification of Recreation-High Use were reclassified to the new and similar classification of HDR, but total acreage was

reduced from 4,992 acres to 4,043 acres. This reduction is ,mostly based on the realization that the amount of acreage originally planned for intensive recreation use per the 1981 MP significantly exceeded the amount necessary to meet public needs and was excessive and not being fully utilized. Areas currently developed as park would continue to operate as parks and no change would occur. However, some of the lands designated as Recreation – High Use would be reclassified to MRML - WM, LDR, and ESAs to better reflect historic use patterns and current land management efforts. The conversion of these lands would have no effect on current or projected public use. Therefore, under the Proposed Action, there would be no short- or long-term, minor, moderate, or major, beneficial, or adverse impacts on topography, geology, soils, or prime farmland as a result of implementing the 2019 MP.

3.6 NATURAL RESOURCES

Operational civil works projects administered by USACE are required, with few exceptions, to prepare an inventory of natural resources. The basic inventory required is referred to within USACE regulations (ER and EP 1130-2-540) as a Level One Inventory. This inventory includes the following: vegetation in accordance with the National Vegetation Classification System through the sub-class level; assessment of the potential presence of special status species including but not limited to Federal and state listed endangered and threatened species, migratory species, and birds of conservation concern listed by the USFWS; land (soils) capability classes in accordance with NRCS soil surveys; and wetlands, which are previously discussed in Section 3.2. In addition to the data from the Level One Inventories, a Habitat Assessment was conducted on October 2-5, 2017 at Joe Pool Lake by an interagency team of TPWD, USFWS, and USACE biologists, foresters, and park rangers using the TPWD's Wildlife Habitat Appraisal Procedure (WHAP) to assist in the preparation of the 2019 MP. A total of 69 data collection sites were selected using aerial photography and knowledge of the Joe Pool Lake staff. The four major habitat types that were selected and assessed were Mixed Forest, Deciduous Forest, Riparian Forest, and Grassland. The WHAP assessment report is included as Appendix E of the 2019 MP.

Vegetation

Joe Pool Lake is located within the Texas Blackland Prairies ecological region, which is a distinct ecoregion located in central Texas. The largest section of the ecoregion is mostly south to north trending, starting at San Antonio and nearly reaching the Oklahoma border north and northeast of Dallas. The other part of the Texas Blackland Prairies trends southwest to northeast, starting slightly southeast of San Antonio. This smaller, more southeastern located part of the ecoregion is commonly called the Fayette Prairie. The entire Texas Blackland Prairies ecoregion covers approximately 19,500 square miles (see Figure 3-3).

The land cover of the Texas Blackland Prairies at the beginning of the 19th century was predominately tallgrass prairie, with forest found primarily along stream courses and some uplands. The common grass and forb species include: little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardi*), yellow Indiangrass (*Sorghastrum nutans*), switchgrass (*Panicum virgatum*), eastern gamagrass (*Tripsacum dactyloides*), tall dropseed (*Sporobolus compositus*), asters (*Aster spp.*), prairie bluet (*Stenaria nigricans*), prairie clovers (*Dalea spp.*), and coneflowers (*Echinacea spp.*). Bottomland hardwood forests are not as prevalent, but where they occur common species include: bur oak (*Quercus macrocarpa*), Shumard oak (*Quercus shumardii*), post oak (*Quercus stellata*), blackjack oak (*Quercus marilandica*), green ash (*Fraxinus pennsylvanica*), pecan (*Carya illinoensis*), cedar elm (*Ulmus crassifolia*), American elm (*Ulmus americana*), winged elm (*Ulmus alata*), sweetgum (*Liquidambar styraciflua*), sugar hackberry (*Celtis laevigata*), and eastern cottonwood (*Populus deltoides*). Slopes and upland forests support mesquites (*Prosopis laevigata*) and several

cedars and junipers (*Juniperus spp.*), and have become more prevalent due to the absence of regular fires.

Five of the most populous metropolitan areas of Texas are located in part or entirely in the Texas Blackland Prairie ecoregion. The close proximity to urban and suburban landscapes has led to many plants escaping into wild plant communities, some of which have dramatically altered the ecosystems where they have spread. Common landscape plants which are aggressive colonizers and commonly escape cultivation include privet (*Ligustrum spp.*), Chinaberry (*Melia azedarach*), Heavenly bamboo (*Nandina domestica*), Pincushions (*Scabiosa atropurpurea*), Chinese Tallow (*Triadica sebifera*), and Tree of Heaven (*Ailanthus altissima*). Several grasses have also been identified as aggressive and/or invasive including Bermuda grass (*Cynodon dactylon*), Bahiagrass (*Paspalum notatum*), and Johnsongrass (*Sorghum halepense*). Giant Salvinia (*Salvinia molesta*) and water hyacinth (*Eichhornia crassipes*) are invasive aquatic plants, and have been spreading aggressively in many USACE reservoirs. Several native plants have also become problematic due to human activities including mesquite (*Prosopis glandulosa*), whitebrush (*Aloysia grati*), yaupon (*Ilex vomitoria*), and several species of juniper (*Juniperus spp.*) [Texas Conservation Action Plan: Texas Blackland Prairies Ecoregion Handbook August 2012].

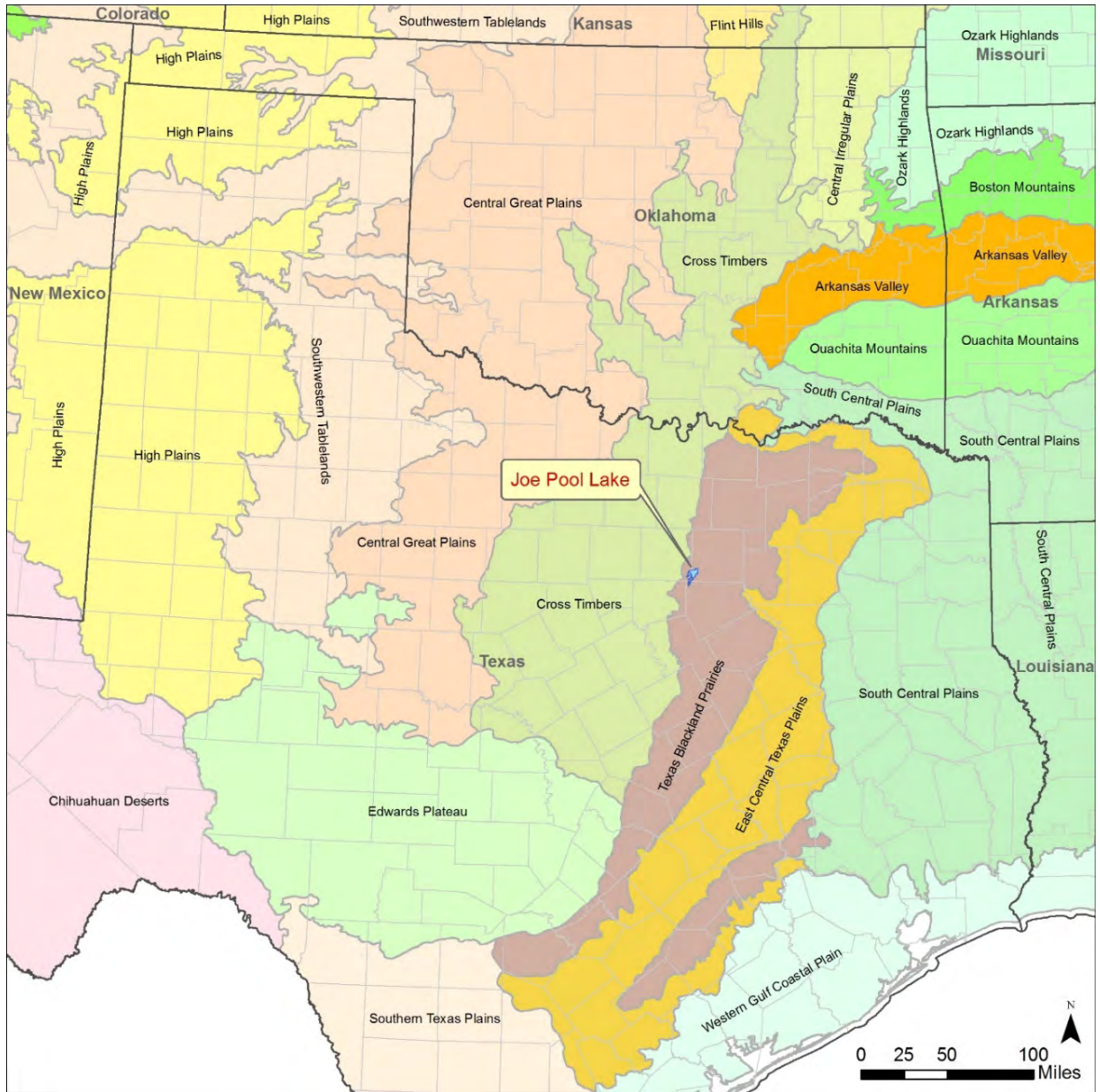


Figure 3-3. Ecoregions of Texas

Fisheries and Wildlife Resources

Joe Pool Lake provides habitat for an abundance of fish and wildlife species. Predominant fish species in the lake are largemouth bass (*Micropterus salmoides*), channel catfish (*Ictalurus punctatus*), white crappie (*Pomoxis annularis*), and white bass (*Morone chrysops*). Other less prominent species include black, yellow, and striped bass; carp; blue and hybrid catfish; gar; sunfish; and trout. Several species have been stocked periodically since 1981 with bass and catfish being the most popular. There is significant fishing pressure at the lake, since it is located within one of the most populated urban metro areas in the United States, leading to fairly restrictive length and bag limits for many species.

Many of the undeveloped open spaces provide habitat for wildlife including coyotes (*Canis latrans*), bobcats (*Lynx rufus*), eastern cottontail rabbit (*Sylvilagus floridanus*), fox squirrel (*Sciurus niger*), nine-banded armadillo (*Dasypus novemcinctus*), striped skunks (*Mephitis mephitis*), and raccoons (*Procyon lotor*). The area also provides habitat for a diverse range of birds and acts as a stopover for migratory birds. The entire USACE land holding at Joe Pool is located within the corporate city limits of Dallas, Grand Prairie, Cedar Hill, and Mansfield. Due to the proximity to urban development, hunting is prohibited at Joe Pool Lake.

3.6.1 Alternative 1: No Action

The No Action Alternative does not involve any activities that would contribute to changes in existing conditions; therefore, no short- or long-term, major, moderate, or minor, beneficial, or adverse impacts on natural resources would be anticipated as a result of implementing the No Action Alternative.

3.6.2 Alternative 2: Proposed Action

The reclassifications, resource management objectives, and resource plan required for the Proposed Action would allow land management and land uses to be compatible with the goals of good stewardship of natural resources. Furthermore, the utility corridors were designated to avoid and minimize impacts on current natural resources by future actions by selecting corridors with lesser quality habitats and that would avoid continued fragmentation of habitats. The Proposed Action would allow project lands to continue supporting the USFWS and the TPWD missions associated with wildlife conservation and implementation of operational practices that would protect and enhance wildlife and fishery populations and habitat. The addition of ESA and MRML-WM lands protects natural resources from various types of adverse impacts such as habitat fragmentation. In addition, the Proposed Action would be compatible with conservation principles and measures to protect migratory birds as mandated by EO 13186.

3.7 THREATENED AND ENDANGERED SPECIES

The Endangered Species Act was enacted to provide a program for the preservation of endangered and threatened species and to provide protection for the ecosystems upon which these species depend for their survival. USFWS is the primary agency responsible for implementing the Endangered Species Act, and is responsible for birds and other terrestrial and freshwater species. USFWS responsibilities under the Endangered Species Act include (1) the identification of threatened and endangered species; (2) the identification of critical habitats for listed species; (3) implementation of research on, and recovery efforts for, these species; and (4) consultation with other Federal agencies concerning measures to avoid harm to listed species.

An endangered species is a species officially recognized by USFWS as being in danger of extinction throughout all or a significant portion of its range. A threatened species is a species likely to become endangered within the foreseeable future throughout all or a significant portion

of its range. Proposed species are those that have been formally submitted to Congress for official listing as threatened or endangered. Species may be considered eligible for listing as endangered or threatened when any of the five following criteria occur: (1) current/imminent destruction, modification, or curtailment of their habitat or range; (2) overuse of the species for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) inadequacy of existing regulatory mechanisms; and (5) other natural or human-induced factors affecting their continued existence.

In addition, USFWS has identified species that are candidates for listing as a result of identified threats to their continued existence. The candidate designation includes those species for which USFWS has sufficient information to support proposals to list as endangered or threatened under the Endangered Species Act; however, proposed rules have not yet been issued because such actions are precluded at present by other listing activity. Although not afforded protection by the Endangered Species Act, candidate species may be protected under other Federal or state laws.

The USFWS's Information for Planning and Consultation (IPaC) database (2018A) lists the threatened and endangered species, and trust resources that may occur within the Joe Pool Lake Federal Fee Boundary (see USFWS Species List and the IPaC Report in Appendix C of the 2019 MP). Based on the IPaC report, there are 6 federally listed species that could be found at Joe Pool Lake (USFWS 2018). The 2019 IPaC report is currently unattainable due to the expiration of government funding during the 2018-2019 government shutdown. A list of these species is presented in Table 3-4. No Critical Habitat has been designated within or near Joe Pool Lake. The species identified as Threatened, Endangered or Candidate Species by TPWD that are not federally listed are included in Appendix C of the 2019 Master Plan as well as a list of Species of Greatest Conservation Need (SGCN) for the Texas Blackland Prairie Ecoregion.

Table 3-4. Federally Listed Threatened and Endangered Species with Potential to Occur at Joe Pool Lake

Common Name	Scientific Name	Federal Status	State Status
Piping Plover	<i>Charadrius melodus</i>	Threatened	Threatened
Whooping Crane	<i>Grus americana</i>	Endangered	Endangered
Least Tern	<i>Sterna antillarum</i>	Endangered	Endangered
Golden-cheeked Warbler	<i>Setophaga chrysoparia</i>	Endangered	Endangered

Source: USFWS 2018

The master plan revision does not entail wind energy aspects, therefore the Red Knot (*Calidris canutus rufa*) was intentionally left out in the above table. As such, the Red Knot will not be addressed any further concerning possible impacts to the species.

Piping Plover and Least Tern preferred habitat mostly consists of open waters, rivers, lakes, estuaries, marshes, and swamps. Typically nesting occurs on sandy to gravely substrates including shorelines and sandbars or other areas that are near open water. Nests are usually above the high water line and close to vegetation (USFWS 2017 A and B). Depending on lake levels, they both may nest along the shorelines or on exposed sandbars at Joe Pool Lake. While pockets of habitat for these two species are present on Joe Pool Lake project lands, no sightings have occurred in recent history, therefore they are considered a potential occurrence at Joe Pool Lake.

Whooping Crane habitat consists of marshes, shallow lakes, lagoons, salt flats, grain and stubble fields, and barrier islands (AOU 1983, Matthews and Moseley 1990) and (NatureServe 2016). While pockets of habitat for this species are present on Joe Pool Lake project lands, no

sightings have occurred in recent history, therefore they are considered a potential occurrence at Joe Pool Lake.

Golden-cheeked Warbler habitat consists of old-growth and mature regrowth Ashe juniper-oak woodlands in rocky terrain (NatureServe 2017B). While pockets of habitat for Golden-cheeked Warbler are present on Joe Pool Lake project lands, few sightings have occurred in recent history, therefore they are considered a rare occurrence Joe Pool Lake.

Texas Parks and Wildlife Department's (TPWD 2018) Annotated County Lists of Rare Species database record the threatened and endangered species that may occur on Joe Pool project lands (see Appendix C of the 2019 MP for the full report).

The Texas Natural Diversity Database (TXNDD), administered by TPWD, manages and disseminates information on occurrence of rare species, native plant communities, and animal aggregations in Texas to help guide project planning efforts. An email was sent on January 29, 2018 requesting this information for the following USGS quadrangles that encompass Joe Pool Lake project lands: Britton, Cedar Hill, Duncanville, and Arlington. USACE received the requested information from TXNDD on February 6, 2018. The next seven paragraphs summarize TXNDD information received.

Near the Joe Pool Lake project lands, several locations were identified by the TXNDD to contain unique communities and species. Among these communities were those that contain the following: Hall's prairie clover (*Dalea hallii*), Warnock's coral-root (*Hexalectris warnockii*) and Plateau milkvine (*Matelea edwardsensis*). Additionally the following mixed plant communities can be found: Ashe Juniper-Oak (*Juniperus ashei-quercus spp.*), Little Bluestem-Indiangrass (*Schizachyrium scoparium-Sorghastrum nutans*), and Cedar Elm-Sugarberry (*Ulmus crassifolia-Celtis laevigata*).

In 1949, Hall's prairie clover was detected at a location on the project lands at Joe Pool Lake. The ideal habitat for this species is rocky, barren limestone and grasslands as well as scrub oak (*Quercus berberidifolia*) (NatureServe 2016B, Barneby, 1977). Because of this information and lack of recent sightings, the occurrence of this species on Joe Pool Lake project lands is considered rare.

In 1986, Warnock's coral-root was detected at a location on the project lands at Joe Pool Lake. The ideal habitat for this species is of oak-juniper-pinyon pine (*Pinus sp.*) leaf litter. Because of this information and of recent sightings, the occurrence of this species on Joe Pool Lake project lands is not considered unusual (NatureServe 2016C).

In 1995 the last recorded sighting of Plateau milkvine was published. The species prefers to live in stony or gravelly soils in open woodlands, climbing on other plants (Lady Bird Johnson Wildflower Center plant database 2018). Because of this information and lack of recent sightings, the occurrence of this species on Joe Pool Lake project lands is considered rare.

The TXNDD reports and the data collected from the WHAP survey confirms that Ashe Juniper-Oak, Little Bluestem-Indiangrass mixed plant communities can be found on the project lands at Joe Pool Lake; thus, the occurrence of these communities on project lands is considered common. The mixed plant community of Cedar Elm-Sugarberry reported in the TXNDD Report, confirmed from data collected for the WHAP report, is limited to a sliver of land in the northeast portion of Joe Pool Lake project lands. In the vicinity of Joe Pool Lake project lands, several patches of native blackland prairie have been recorded (TXNDD 2018).

3.7.1 Alternative 1: No Action

The No Action Alternative does not involve any activities that would contribute to changes in existing conditions; therefore, no short- or long-term, major, moderate, or minor, beneficial, or

adverse impacts on threatened and endangered species would be anticipated as a result of implementing the No Action Alternative.

3.7.2 Alternative 2: Proposed Action

Under the Proposed Action, the USACE would continue cooperative management plans with the USFWS and TPWD to preserve, enhance, and protect vegetation and wildlife habitat resources. To further management opportunities and beneficially impact habitat diversity, the reclassifications proposed in the 2019 MP include 1,507 acres as ESAs. Under this reclassification, several land parcels previously classified as Recreation – High Use, Rec/Wildlife Management – Low Use, and Project Operations lands were converted to ESAs in order to recognize those areas having the highest ecological value and to ensure they are given the highest order of protection among possible land classifications. The conversion of these lands was supported by recommendations from the USFWS, TPWD, and the City of Grand Prairie and would have no effect on current or projected public use. In addition, the establishment of seven strategically located utility corridors will serve to reduce future loss of natural resources that could potentially occur from placement of utility lines on project lands. However, long-term, beneficial impacts on natural resources could occur as a result of implementing the reclassifications outlined in the 2019 MP. Any future activities that could potentially result in impacts on federally listed species will be coordinated with USFWS through Section 7 of the Endangered Species Act. Implementation of the Proposed Action will have No Effect on federally listed species.

3.8 INVASIVE SPECIES

An invasive species is defined as a plant or animal that is non-native (or native nuisance) to an ecosystem and whose introduction causes, or is likely to cause, economic and/or environmental harm, or harm to human health. Invasive species can thrive in areas beyond their normal range of dispersal. These species are characteristically adaptable, aggressive, and have high reproductive capacity. Their vigor, along with a lack of natural enemies or controls, often leads to outbreak populations with some level of negative effects on native plants, animals, and ecosystem functions and are often associated with disturbed ecosystems and human activities.

Section 3.8 of the 2019 Master Plan further describes invasive species at Joe Pool Lake.

3.8.1 Alternative 1: No Action

The No Action Alternative does not involve any activities that would contribute to changes in existing conditions, so Joe Pool Lake would continue to be managed according to the existing invasive species management practices. There would be no short- or long-term, minor, moderate, or major, beneficial, or adverse impacts from invasive species as a result of implementing the No Action Alternative.

3.8.2 Alternative 2: Proposed Action

The land reclassifications, resource objectives, and resource plan required to revise the Joe Pool Lake MP are compatible with the lake's invasive species monitoring and management practices (see Chapter 3 in 2019 MP). Therefore, invasive species would continue to be managed, and no significant adverse impacts on resources would occur as a result of implementing the 2019 MP.

3.9 CULTURAL, HISTORICAL, AND ARCHAEOLOGICAL RESOURCES

Cultural History Sequence

The earliest known Native American civilization within the Joe Pool Lake area is documented to have occurred about 12,000 years before present. Evidence suggests that the

region was occupied by small groups of highly mobile hunter-gatherers that traveled over very large territories. Traditionally thought of as big-game hunters, more recent evidence indicates Paleo-Indians exploited a much broader range of animal and plant resources.

Local tradition holds that Native Americans of the Caddo Nation inhabited the Joe Pool Lake area prior to the arrival of the first white settlers in the early 1840s. The majority of these early settlers were farmers operating small family farms growing mainly wheat and corn. The population grew steadily between the 1840s and 1870s. After the Civil War, cotton farming became an important agricultural activity in the region and tenant farming was a major social institution. The arrival of the railroads in the early 1870s allowed farmers access to markets and led to a major increase in the number of farms. Many of the historic resources at Joe Pool Lake are archeological remains of house sites and farmsteads dating from the late 19th century through the mid-20th century. The cultural, historical, and archaeological resources are described in detail in Section 2.3 of the 2019 MP and are incorporated herein by reference.

Previous Investigations

Initial archeological surveys at Joe Pool Lake were conducted by Southern Methodist University (SMU) in 1977 and 1978. During those surveys, 40 archeological sites were recorded (15 prehistoric, 23 historic, and two with both prehistoric and historic components). In 1979 and 1980, SMU conducted test excavations at 16 prehistoric sites and crews from North Texas State University investigated 23 historic period sites.

In 1985 and 1986, SMU conducted data recovery investigations at five prehistoric sites and 13 historic sites. During this same period, SMU located and recorded 12 historic home sites based on locations shown on historic maps. Limited survey work since then has added to the number of known archeological sites.

Recorded Cultural Resources

Currently, 60 archeological sites have been recorded at Joe Pool Lake. Seven of these sites have been determined eligible for the National Register of Historic Places (NRHP) and 44 sites have been determined ineligible. The remaining nine sites have not yet been evaluated for NRHP eligibility. Surveys conducted in the 1970s were not systematic and may not be considered adequate by today's standards.

Cultural Resource Management at Joe Pool Lake

Numerous cultural resources laws establish the importance of cultural resources to our Nation's heritage. With the passage of these laws, the historical intent of Congress has been to ensure that the Federal government protects cultural resources. Stewardship of cultural resources on USACE Civil Works water resources projects is an important part of the overall Federal responsibility.

As funding allows, a Cultural Resources Management Plan (CRMP) shall be developed and incorporated into the Operational Management Plan in accordance with EP 1130-2-540. The purpose of the CRMP is to provide a comprehensive program to direct the historic preservation activities and objectives at Joe Pool Lake. Completion of a full inventory of cultural resources at Joe Pool Lake is a long-term objective that is needed for compliance with Section 110 of the National Historic Preservation Act (NHPA).

3.9.1 Alternative 1: No Action

There would be no additional short- or long-term, minor, moderate, or major, beneficial, or adverse impacts on cultural, historical, or archaeological resources as a result of implementing the No Action Alternative, as there would be no changes to the existing Master Plan.

3.9.2 Alternative 2: Proposed Action

Impacts on cultural, historical, and archaeological resources were considered during the refinement processes of land reclassifications. Based on previous surveys at Joe Pool Lake, the required reclassifications, proposed utility corridors, resource objectives, and resource plan would not change current cultural resource management plans or alter areas where these resources exist. All future activities would be coordinated with the State Historic Preservation Officer and federally recognized Tribes to ensure compliance with Section 106 of the NHPA, the Archaeological Resources Protection Act, and the Native American Graves Protection and Repatriation Act. Therefore, no significant adverse impacts on cultural, historical, or archaeological resources would occur as a result of implementing the 2019 MP.

3.10 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

Located primarily within the southwest portion of Dallas County and extending into Tarrant and Ellis counties, the primary zone of interest (ZOI) for socio-economic analysis of Joe Pool Lake is defined as those counties surrounding the lake, which are Dallas, Ellis, Tarrant, and Johnson Counties, in north central Texas. The population, education level, employment rates, income, and household characteristics of the area are discussed in detail in Section 2.4 of the 2019 MP and are incorporated herein by reference (USACE, 2019).

Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was issued by President Clinton on 11 February 1994. It was intended to ensure that proposed Federal actions do not have disproportionately high and adverse human health and environmental effects on minority and low-income populations and to ensure greater public participation by minority and low-income populations. It requires each agency to develop an agency-wide environmental justice strategy. A Presidential Transmittal Memorandum issued with the EO states that “each Federal agency shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by the NEPA 42 U.S.C. section 4321, et seq.”

EO 12898 does not provide guidelines as to how to determine concentrations of minority or low-income populations. However, analysis of demographic data on race and ethnicity and poverty provides information on minority and low-income populations that could be affected by the proposed actions. The U.S. Census American Community Survey provides the most recent estimates available for race, ethnicity, and poverty. Minority populations are those persons who identify themselves as Black, Hispanic, Asian American, American Indian/Alaskan Native, Pacific Islander, or Other. Poverty status is used to define low-income. Poverty is defined as the number of people with income below poverty level, which was \$24,588 for a family of four in 2017, according to the U.S. Census Bureau. A potential disproportionate impact may occur when the minority in the study area exceeds 50 percent or when the percent minority and/or low-income in the study area are meaningfully greater than those in the region.

Protection of Children

EO 13045 requires each Federal agency “to identify and assess environmental health risks and safety risks that may disproportionately affect children” and “ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from

environmental health risks or safety risks.” This EO was prompted by the recognition that children, still undergoing physiological growth and development, are more sensitive to adverse environmental health and safety risks than adults. The potential for impacts on the health and safety of children is greater where projects are located near residential areas. The U.S. Census estimates show that persons under 18 years of age range from 27.3 percent (%) of the population in Johnson County and in the State of Texas to 27.6% in Dallas County, 28.0% in Tarrant County, and 29.0% of the population in Ellis County (U.S. Census Bureau 2015d).

Johnson and Ellis counties in the zone of interest have substantially lower minority populations than the State of Texas, while Dallas and Tarrant counties are greater than the State percentage (see Table 3-6), and all have minority populations that are below 50%. In Tarrant, Johnson, and Ellis counties, the percentage of the population living in poverty and children under 18 living in poverty is less than in the State of Texas. Dallas County’s percentage of all ages and children under 18 living in poverty is higher than for the State of Texas.

Table 3-5. Minority and Poverty Percentages for State of Texas and Counties in the Zone of Interest

	Minority Population (%)	All Ages in Poverty (%)	Under 18 in Poverty (%)
Texas	29.6	16.7	23.9
Dallas County	46.5	18.6	28.3
Tarrant County	33.4	14.4	20.7
Johnson County	12.8	12.1	16.9
Ellis County	21.4	11.0	15.2
Zone of Interest Average Total	28.5	14.0	20.3

Sources: 2016 U.S. Census Bureau Statistics

3.10.1 Alternative 1: No Action

Under the No Action Alternative, there would be no changes to the existing MP, with the USACE, TPWD, and the City of Grand Prairie continuing to manage Joe Pool Lake’s natural resources as set forth in the 1981 MP. There would be no short- or long-term, minor, moderate, or major adverse impacts on socioeconomic resources. Existing beneficial socioeconomic impacts would continue, as visitors would continue to come to the lake from surrounding areas. In addition to camping, many visitors purchase goods such as groceries, fuel, and camping supplies locally; eat in local restaurants; stay in local hotels and resorts; play golf at local golf courses; and shop in local retail establishments. These activities would continue to bring revenues to local companies, provide jobs for local residents, and generate local and state tax revenues. There would be no disproportionately high or adverse impacts on minority or low-income populations or children with the implementation of the No Action Alternative.

3.10.2 Alternative 2: Proposed Action

Under the Proposed Action, the land reclassifications, resources objectives, and resource plan reflect changes in land management and land uses that have occurred since 1981. Joe Pool Lake offers a variety of recreational opportunities for visitors. It is beneficial to the local economy through direct and indirect job creation and local spending by visitors. Beneficial impacts would be similar to the No Action Alternative. There would be no adverse impacts on

economy in the area and no disproportionately high or adverse impacts on minority or low-income populations or children as a result of the Proposed Action.

3.11 RECREATION

Because six of the eight reservoirs in the Upper Trinity River system are located within the Dallas-Fort Worth Metroplex, the majority of the visitors to Joe Pool Lake come from within a 30 mile radius, thus from Dallas, Tarrant, Ellis and Johnson counties. These visitors are a diverse group of people with a wide variety of interests. Examples of visitors include campers who utilize the City of Grand Prairie and TPWD operated campgrounds around the reservoir; adjacent residents; anglers who fish for recreation or participate in fishing tournaments; marina customers who utilize the marina on the reservoir; and day users who picnic, hike, bird watch, and bicycle. Recreational facilities, activities, and needs are discussed in detail in Section 2.5 of the 2019 Master Plan.

3.11.1 Alternative 1: No Action

Under the No Action Alternative, there would be no short- or long-term, minor, moderate, or major, beneficial, or adverse impacts on recreational resources, as there would be no changes to the existing MP.

3.11.2 Alternative 2: Proposed Action

Joe Pool Lake is beneficial to the local visitors and also offers a variety of recreational opportunities. Even though the amount of acreage available for High Density and Low Density Recreation would decrease with implementation of the 2019 MP, these land reclassifications reflect changes in land management and land uses that have occurred since 1981 at Joe Pool Lake. The conversion of these lands would have no effect on current or projected public use. Therefore, no adverse impacts on area recreational resources would result from the revision of the Joe Pool Lake Master Plan.

3.12 AESTHETIC RESOURCES

Joe Pool Lake and surrounding federal lands offer public, open space value and scenic vistas that are unique to the region. Natural Resources Management objectives will continue to minimize activities which would disturb the scenic beauty and aesthetics of the lake.

3.12.1 Alternative 1: No Action

There would be no short- or long-term, minor, moderate, or major, beneficial, or adverse impacts on visual resources as a result of implementing the No Action Alternative, as there would be no changes to the existing MP.

3.12.2 Alternative 2: Proposed Action

Joe Pool Lake currently plays a pivotal role in availability of parks and open space in Dallas, Tarrant, Ellis, and Johnson counties. Even though the amount of acreage available for HDR reduces from 4,992 to 4,043 and MRML – LDR, MRML-WM, and MRML-VM from 3,360 to 2,732 with implementation of the 2019 Master Plan, these land reclassifications reflect changes in land management and land uses that have occurred since 1981 at Joe Pool Lake. The conversion of these lands would have no effect on current or projected public use or visual aesthetics. Furthermore, the increase in the acreage of land classified as ESAs and MRML – Wildlife Management would protect lands that are aesthetically pleasing and available for passive recreation activity Joe Pool Lake and limit future development. The establishment of utility corridors would further limit habitat fragmentation and potential impacts to aesthetics areas at Joe Pool Lake. Therefore, no adverse impacts on visual resources would result from implementation of the 2019 MP.

3.13 HAZARDOUS MATERIALS AND SOLID WASTE

This section describes existing conditions within the Joe Pool Lake area with regard to potential environmental contamination and the sources of releases to the environment. Contaminants could enter the Joe Pool Lake environment via air or water pathways. The highways and roads, marinas, and private residences in the vicinity of the lake could also provide sources of contaminants. There is one marina at Joe Pool Lake that provides boat fueling service. The fuel dock is regulated by the U.S. Coast Guard (USCG) with regard to spill containment and cleanup requirements. There have been no major releases of boating fuel to the lake. There are also numerous public campgrounds/resorts and recreation areas/parks around the lake that could contribute small amounts of hazardous materials and waste to the watershed. Illegal trash dumping on project lands by individuals and businesses is a persistent problem. USACE and area law enforcement officials work cooperatively to apprehend those responsible for illegal trash dumping.

Golf courses, numerous private residences, and commercial facilities also surround the lake shores, and fertilizer and pesticide/herbicide use at those locations could contribute minor amounts of hazardous materials to the lake. Public trash and garbage pickup and disposal is provided for all properties around Joe Pool Lake by commercial solid waste removal contractors.

3.13.1 Alternative 1: No Action

There would be no short- or long-term, minor, moderate, or major, beneficial, or adverse impacts on hazardous, toxic, radioactive, or solid wastes as a result of implementing the No Action Alternative, as there would be no changes to the existing MP.

3.13.2 Alternative 2: Proposed Action

The land reclassifications proposed by the 2019 MP would be compatible with Joe Pool Lake's hazardous and toxic waste and solid waste management practices. Therefore, no short- or long-term, minor, moderate, or major, beneficial, or adverse impacts due to hazardous, toxic, radioactive, or solid wastes would occur as a result of implementing the 2019 MP.

3.14 HEALTH AND SAFETY

As mentioned earlier in this document, Joe Pool Lake's authorized purposes include flood risk management, water conservation, and recreation. Compatible uses incorporated in project operation management plans include conservation and fish and wildlife habitat management components. The USACE, with some assistance from the TPWD and USFWS, has established public outreach programs to educate the public on water safety and conservation of natural resources. In addition to the water safety outreach programs, the project has established recreation management practices in place to protect the public. These include safe boating and swimming regulations, and speed limit and pedestrian signs for park roads. Joe Pool Lake also has solid waste management plans in place for camping and day use areas that are maintained by the respective partners that hold the lease.

3.14.1 Alternative 1: No Action

Under the No Action Alternative, the Joe Pool MP would not be revised. No significant adverse impacts on human health or safety would be anticipated.

3.14.2 Alternative 2: Proposed Action

Under the Proposed Action, the proposed revisions to the Joe Pool Lake MP classifications of Restricted surface water (24 acres) and Designated No-Wake areas (103 acres) would maintain and in some cases, improve boating safety near the Joe Pool Dam intake structure

and key recreational water access areas such as boat ramps and designated swimming areas. The project would continue to have reporting guidelines in place should water quality become a threat to public health. Existing regulations and safety programs throughout the Joe Pool Lake project area would continue to be enforced to ensure public safety. There would be no short- or long-term, minor, moderate, or major, adverse impacts on public health and safety as a result of implementing the Proposed Action.

3.15 SUMMARY OF CONSEQUENCES AND BENEFITS

Table 3-7 provides a tabular summary of the consequences and benefits for the No Action and Proposed Action alternatives for each of the 15 assessed resource categories.

Table 3-6. Summary of Consequences and Benefits

Resource	Change Resulting from Revised Master Plan	Environmental Consequences		Benefits Summary
		No Action Alternative	Proposed Action	
Land Use	No effect on private lands. Emphasis is on protection of wildlife and environmental values on USACE land and maintaining current level of developed recreation facilities.	Fails to recognize recreation trends and regional natural resource priorities.	Recognizes recreation trends and regional natural resource priorities identified by USACE, TPWD, and public comment.	Land classification changes and new resource objectives fully recognize passive use recreation trends and regional environmental values.
Water Resources including Groundwater, Wetlands, and Water Quality	Minor change to recognize value of wetlands.	Fails to recognize the water quality benefits of good land stewardship and need to protect wetlands.	Promotes restoration and protection of wetlands and good land stewardship.	Specific resource objective promotes restoration and protection of wetlands.
Climate	Minor change to recognize need for sustainable, energy efficient design.	Fails to promote sustainable, energy efficient design.	Promotes land management practices and design standards that promote sustainability.	Specific resource objectives promote national climate change mitigation goal. LEED standards for green design, construction, and operation activities will be employed to the extent practicable.
Climate Change and Greenhouse Gases	Same as for Climate	Same as for Climate	Same as for Climate	Same as for Climate
Air Quality	Negligible change to help reduce air emissions.	No effect	Promotes activities and goals that will help to reduce emissions	Reduces HDR and MRML-LDR acres, which in turn reduces the motor vehicle exhaust that is produced. New resource objectives also help to reduce emissions.
Topography, Geology and Soils	Minor change to place emphasis on good stewardship of land and water resources.	Fails to specifically recognize known and potential soil erosion problems.	Encourages good stewardship that would reduce existing and potential erosion.	Specific resource objectives call for stopping erosion from overuse and land disturbing activities.

Resource	Change Resulting from Revised Master Plan	Environmental Consequences		Benefits Summary
		No Action Alternative	Proposed Action	
Natural Resources	Moderate benefits through land reclassification and resource objectives.	Fails to recognize ESAs, and regional priorities calling for protection of important wildlife and vegetation habitat.	Gives full recognition of sensitive resources and regional trends and priorities related to natural resources.	Reclassification of lands included 1,507 acres of ESA and an increase in lands emphasizing wildlife management.
Threatened and Endangered Species, including TXNDD species.	Moderate benefits from land reclassifications and utility corridors for recognizing both federal and state-listed species.	Fails to recognize current federal and state-listed species.	Fully recognizes federal and state-listed species as well as TXNDD species listed by TPWD.	The MP sets forth the most recent listing of federal and state-listed species and addresses on-going commitments associated with USFWS Biological Opinions.
Invasive Species	Minor change to recognize several recent and potentially aggressive invasive species.	Fails to recognize current invasive species and associated problems.	Fully recognizes current species and the need to be vigilant as new species may occur.	Specific resource objectives specify that invasive species shall be monitored and controlled as needed.
Cultural Resources	Minor change to recognize current status of cultural resources.	Included cursory information about cultural resources that is inadequate for future management and protection.	Recognizes the presence of cultural resources and places emphasis on protection and management.	Reclassification of lands and specific resource objectives were included for protection of cultural resources.
Socioeconomics and Environmental Justice	No change	No effect	No effect	No added benefit
Recreation	Moderate benefits to outdoor recreation programs.	Fails to recognize current outdoor recreation trends.	Fully recognizes current outdoor recreation trends and places special emphasis on trails.	Specific management objectives focused on outdoor recreation opportunities and trends are included.

Resource	Change Resulting from Revised Master Plan	Environmental Consequences		Benefits Summary
		No Action Alternative	Proposed Action	
Aesthetic Resources	Minor benefits through land reclassification, utility corridors, and resource objectives.	Fails to minimize activities that disturb the scenic beauty and aesthetics of the lake.	Promotes activities that limit disturbance to the scenic beauty and aesthetics of the lake.	No added benefit Specific management objectives to minimize activities that disturb the scenic beauty and aesthetics of the lake.
Hazardous, Toxic, Radioactive Wastes	Minor to moderate benefits to HTRW issues by limiting HDR usage on ESA and WM areas.	Fails to recognize current HTRW problems associated with incompatible recreation use on WM areas.	Fully recognizes compatible use activities and limits those recreational activities that would be detrimental to the designated land use classifications.	Specific management objectives focused on outdoor recreation opportunities and trends that are compatible with the designated land used classifications and limits those that are not.
Health and Safety	Minor change to promote public safety awareness.	Fails to emphasize public safety programs.	Recognizes the need for public safety programs.	Includes specific management objectives to increase water safety outreach efforts. Also, classifies 24 acres of water surface as restricted and 103 as designated no-wake for public safety purposes.

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SECTION 4: CUMULATIVE IMPACTS

The most severe environmental degradation may not result from the direct effects of any particular action, but from the combination of effects of multiple, independent actions over time. As defined in 40 CFR 1508.7 (CEQ Regulations), a cumulative effect is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.

By Memorandum dated June 24, 2005, from the Chairman of the CEQ to the Heads of Federal Agencies, entitled "Guidance on the Consideration of Past Actions in Cumulative Effects Analysis", CEQ made clear its interpretation that "...generally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions..." and that the "...CEQ regulations do not require agencies to catalogue or exhaustively list and analyze all individual past actions." This cumulative impacts analysis summarizes expected environmental impacts from the combined impacts of past, current, and reasonably foreseeable future activities affecting any part of the human or natural environments impacted by the Proposed Action.

4.1 PAST IMPACTS WITHIN THE ZONE OF INTEREST

Joe Pool Lake was authorized for construction in 1965 as a multi-purpose reservoir for flood control, water conservation, recreation and fish and wildlife as contained in the River and Harbor Act of 1965 (PL 89-298, in accordance with the total plan of improvement for the Trinity River as outlined in House Document 276 (89th Congress, 1st Session). Construction of Joe Pool Dam began December 6, 1979, and was completed in May 1986. Deliberate impoundment began in January 1986 and the conservation pool was filled in May 1989. The total project area at Joe Pool Lake encompasses 15,067 acres, including the 6,707 acres of surface water at normal pool elevation of 522.0 NGVD29. The entire 15,067 acres were acquired in fee simple title by USACE with perpetual Flowage Easements on an additional 1,904 acres up to elevation 541.0 NGVD29.

4.2 CURRENT AND REASONABLY FORESEEABLE PROJECTS WITHIN AND NEAR THE ZONE OF INTEREST

Future management of the 1,904 acres of Flowage Easement Lands at Joe Pool Lake includes routine inspection of these areas to ensure that the Government's rights specified in the easement deeds are protected. In almost all cases, the Government acquired the right to prevent placement of fill material or habitable structures on the easement area. Placement of any structure that may interfere with the USACE flood risk management and water conservation missions may also be prohibited.

USACE policy encourages the establishment of designated corridors on project lands, where feasible, to serve as the preferred location for future outgrants such as easements for roads or utility lines.

The North Central Texas Council of Governments (NCTCOG) coordinates with cities, counties and transportation partners to plan road, transit, bicycle and pedestrian transportation improvements for 16 counties comprising the NCTCOG and serves as the Metropolitan Planning Organization for the Dallas-Fort Worth Area. NCTCOG's Mobility 2040 plan was used as a reference document for this Master Plan. Items recommended for implementation in the Mobility 2040 plan that are of significance to the area surrounding Joe Pool Lake include the following:

- Widening Lakeridge Parkway, a regionally important arterial, from the current 2 lanes to 6 lanes by 2040

- Widening Camp Wisdom Road, a regionally important arterial, from the current 2 lanes to 4 lanes by 2040
- Construction of light rail lines that roughly parallel US 287 on the south side of the lake and US 67 on the east side of the lake
- Addition of new or additional toll road capacity to SH 360 on the west side of the lake
- Adding links to the Regional Veloweb that will serve the area encircling Joe Pool Lake.

National USACE policy set forth in ER 1130-2-550, Appendix H, states that USACE lands will, in most cases, only be made available for roads that are regional arterials or freeways (as defined in ER 1130-2-550). All other types of proposed roads, including driveways and alleys, are generally not permitted on USACE lands. The proposed expansion or widening of existing roadways on USACE lands will be considered on a case-by-case basis.

4.3 ANALYSIS OF CUMULATIVE IMPACTS

Impacts on each resource were analyzed according to how other actions and projects within the zone of interest might be affected by the No Action Alternative and Proposed Action. Impacts can vary in degree or magnitude from a slightly noticeable change to a total change in the environment. For the purpose of this analysis the intensity of impacts will be classified as negligible, minor, moderate, or major. These intensity thresholds were previously defined in Section 3.0. Moderate growth and development are expected to continue in the vicinity of Joe Pool Lake and cumulative adverse impacts on resources would not be expected when added to the impacts of activities associated with the Proposed Action or No Action Alternative. A summary of the anticipated cumulative impacts on each resource is presented below.

4.3.1 Land Use

A major impact would occur if any action is inconsistent with adopted land use plans or if an action would substantially alter those resources required for, supporting, or benefiting the current use. Land use around Joe Pool Lake has experienced little change since it is almost all urbanized. Under the No Action Alternative, land use would not change. Although the Proposed Action would result in the reclassification of project lands, the reclassifications were developed to help fulfill regional goals associated with good stewardship of land resources that would allow for continued use of project lands.

Section 6.1 of the 2019 Master Plan also identifies the need and location for proposed utility corridors. The purpose of utility corridors is to condense the footprint and associate impacts of any future roads and utilities crossings on USACE lands. Therefore, cumulative impacts on land use within the area surrounding Joe Pool Lake, when combined with past and proposed actions in the region, are anticipated to be negligible.

4.3.2 Water Resources

A major impact would occur if any action is inconsistent with adopted surface water classifications or water use plans, or if an action would substantially alter those resources required for, supporting, or benefiting the current use. Joe Pool Lake was developed for flood risk management, water conservation, fish and wildlife, and recreation purposes. The reclassifications and resource objectives required to revise the Joe Pool Lake MP are compatible with water use plans and surface water classification; further, they were developed to help fulfill regional goals associated with good stewardship of water resources that would allow for continued use of water resources associated with Joe Pool Lake. Therefore, cumulative impacts on water resources within the area surrounding Joe Pool Lake, when combined with past and proposed actions in the region, are anticipated to be minor.

Other activities surrounding Joe Pool Lake, such as the addition of future utility lines in corridors, which would require boring beneath streams in most cases to avoid impacts, have been identified as having the potential to contribute directly to the cumulative impacts on water quality; however, water quality monitoring will continue to be used to assess any changes in these conditions. However, the cumulative impacts on water quality from the Proposed Action at Joe Pool Lake are anticipated to be negligible when combined with past and proposed actions in the area.

4.3.3 Climate

The Proposed Action would neither affect nor be affected by the climate. Therefore, implementation of the revised land use classifications in the 2019 MP, when combined with other existing and proposed projects in the region, would not result in major cumulative impacts on the climate.

4.3.4 Climate Change and Greenhouse Gas

Under the Proposed Action, current Joe Pool Lake project management plans and monitoring programs would not be changed. In the event that GHG emission issues become significant enough to impact the current operations at Joe Pool Lake, the 2019 MP and all associated documents would be reviewed and revised as necessary. Therefore, implementation of the 2019 MP, when combined with other existing and proposed projects in the region, would result in negligible cumulative impacts on climate change or GHG.

4.3.5 Air Quality

No major highway or roadway projects are scheduled near the zone of interest for Joe Pool Lake; therefore, limiting the amount of new emissions that could potentially affect air quality within the region. The Proposed Action would not adversely impact air quality within the area. Vehicle traffic along park and area roadways and routine daily activities in nearby communities contribute to current and future emission sources; however, the impacts associated with the reclassification of lands at Joe Pool Lake under the Proposed Action would be negligible. Seasonal prescribed burning could occur on Joe Pool Lake to help maintain the blackland prairie restoration being implemented by TPWD in Cedar Hills State Park, but would have minor, negative impacts on air quality through elevated ground-level O₃ and particulate matter concentrations; however, these seasonal burns would be scheduled so that impacts are minimized. Implementation of the 2019 MP, when combined with other existing and proposed projects in the region, could result in minor adverse and beneficial cumulative impacts on air quality.

4.3.6 Topography, Geology, and Soils

A major impact could occur if a proposed future action exacerbates or promotes long-term erosion, if the soils are inappropriate for the proposed construction and would create a risk to life or property, or if there would be a substantial reduction in agricultural production or loss of Prime Farmland soils. Cumulative impacts on topography, geology, and soils within the area surrounding Joe Pool Lake, when combined with past and proposed actions in the region, are anticipated to be negligible.

4.3.7 Natural Resources

The significance threshold for natural resources would include a substantial reduction in ecological processes, communities, or populations that would threaten the long-term viability of a species or result in the substantial loss of a sensitive community that could not be offset or otherwise compensated. Past, present, and future projects are not anticipated to impact the viability of any plant species or community, rare or sensitive habitats, or wildlife. The establishment of ESA, MRML - WM, and MRML - VM areas, as well as resource objectives that favor protection and restoration of valuable natural resources will have beneficial cumulative

impacts. No identified projects would threaten the viability of natural resources. Therefore, there would be major long-term beneficial impacts to natural resources resulting from the revision of the 2019 Joe Pool MP when combined with past and proposed actions in the area.

4.3.8 Threatened and Endangered Species

The Proposed Action and No Action Alternative would not adversely impact threatened, endangered and TXNDD species within the area. Should federally listed species change in the future (e.g., delisting of the Least Tern or other species or listing of new species), associated requirements will be reflected in revised land management practices in coordination with the USFWS. The USACE would continue cooperative management plans with the USFWS and TPWD to preserve, enhance, and protect critical wildlife habitat resources. The proposed utility corridors would limit further fragmentation of habitat and confine ongoing maintenance disturbances.

No new projects are proposed for USACE lands within the Joe Pool Lake project area, and past, present, and future projects are not anticipated to impact threatened and endangered species as they will be coordinated with the appropriate resource agencies. Therefore, there would be major long-term beneficial impacts on threatened and endangered species resulting from the revision of the Joe Pool Lake 1981 MP when combined with past and proposed actions in the area.

4.3.9 Invasive Species

To the extent that funding will allow, USACE will continue its proactive, cooperative herbicide treatments with TPWD and the City of Grand Prairie to control these species that affect not only the natural biological resources, but also recreational opportunities. Pesticide treatment for invasive ants will also continue. The USACE will also continue to monitor for zebra mussels and take all practicable measures to prevent them from becoming a nuisance to Joe Pool Lake.

Invasive species control has and will continue to be conducted on various areas across the project lands. Implementing Best Management Practices (BMPs) will help reduce the introduction and distribution of invasive species, ensuring that proposed actions in the region will not contribute to the overall cumulative impacts related to invasive species.

The land reclassifications required to revise the 1981 MP are compatible with the Joe Pool Lake invasive species management practices. Therefore, there would be minor long-term beneficial impacts on reducing and preventing invasive species within the area surrounding Joe Pool Lake.

4.3.10 Cultural, Historical, and Archaeological Resources

The Proposed Action would not affect cultural resources or historic properties, as the master plan revision does not involve any ground disturbing activities. However, ESA and WM lands provide additional protection against ground disturbances. Additionally, the proposed Utility Corridors would restrict any future pipelines, roads, or other infrastructure to already disturbed areas, further limiting impacts on cultural resources. Therefore, this action, when combined with other existing and proposed projects in the region, would not result in major cumulative impacts on cultural resources or historic properties.

4.3.11 Socioeconomics and Environmental Justice

The Proposed Action would not result in the displacement of persons (minority, low-income, children, or otherwise) as a result of implementing the reclassifications, resources objectives, and resource plan proposed in the 2019 MP. Therefore, the effects of the Proposed Action on environmental justice and the protection of children, when combined with other ongoing and proposed projects in the Joe Pool Lake area, would not be considered a major cumulative effect.

4.3.12 Recreation

Joe Pool Lake provides regionally significant outdoor recreation benefits including a variety of recreation opportunities. Even though the amount of acreage available for High Density Recreation would decrease as a result of implementing the reclassifications, resources objectives, and resource plan proposed in the 2019 MP, these modifications reflect changes in land management and historic recreation use patterns that have occurred since 1981 at Joe Pool Lake. The conversion of these lands would have no effect on current or projected public use. Therefore, the Proposed Action, when combined with other existing and proposed projects in the region, would result in negligible beneficial cumulative impacts on area recreational resources.

4.3.13 Aesthetic Resources

No impacts on visual resources would occur as a result of implementing the reclassifications, resources objectives, and resource plan proposed in the 2019 MP. The Proposed Action, especially the classification of ESAs, in conjunction with other projects in the region, would result in minor beneficial cumulative impacts on the visual resources in the Joe Pool Lake area.

4.3.14 Hazardous Materials and Solid Waste

No hazardous material or solid waste concerns would be expected with implementation of the 2019 MP; therefore, when combined with other ongoing and proposed projects in the Joe Pool Lake area, there would be no major cumulative effects on hazardous materials and solid waste.

4.3.15 Health and Safety

No health or safety risks would be created by the Proposed Action. The effects of implementing the 2019 MP, when combined with other ongoing and proposed projects in the Joe Pool Lake area, would not be considered a major cumulative effect.

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SECTION 5: COMPLIANCE WITH ENVIRONMENTAL LAWS

This EA has been prepared to satisfy the requirements of all applicable environmental laws and regulations, and has been prepared in accordance with the CEQ's implementing regulations for NEPA, 40 CFR Parts 1500 – 1508, and the USACE ER 200-2-2, *Environmental Quality: Procedures for Implementing NEPA*. The revision of the 2019 MP is consistent with the USACE's Environmental Operating Principles. The following is a list of applicable environmental laws and regulations that were considered in the planning of this project and the status of compliance with each:

Fish and Wildlife Coordination Act of 1958, as amended – The USACE initiated public involvement and agency scoping activities to solicit input on the 2019 MP revision process, as well as identify reclassification proposals, and identify significant issues related to the Proposed Action. Information provided by USFWS and TPWD on fish and wildlife resources has been utilized in the development of the 2019 MP.

Endangered Species Act of 1973, as amended – Current lists of threatened or endangered species were compiled for the 2019 MP. There would be no adverse impacts on threatened or endangered species resulting from the revision of the 1981 MP. However, continued long-term beneficial impacts, such as habitat protection, could occur as a result of the revision of the 2019 Master Plan.

EO 13186 (Migratory Bird Habitat Protection) – Sections 3a and 3e of EO 13186 direct Federal agencies to evaluate the impacts of their actions on migratory birds, with emphasis on species of concern, and inform the USFWS of potential negative impacts on migratory birds. The 1981 MP revision will not result in adverse impacts on migratory birds or their habitat. Beneficial impacts could occur through protection of habitat as a result of the 2019 MP revision.

Migratory Bird Treaty Act, as amended – The Migratory Bird Treaty Act of 1918 extends Federal protection to migratory bird species. The nonregulated “take” of migratory birds is prohibited under this act in a manner similar to the prohibition of “take” of threatened and endangered species under the Endangered Species Act. The timing of resource management activities would be coordinated to avoid impacts on migratory and nesting birds.

CWA of 1977, as amended – The Proposed Action is in compliance with all state and Federal CWA regulations and requirements and is regularly monitored by the USACE and TCEQ for water quality. A state water quality certification pursuant to Section 401 of the CWA is not required for the 2019 MP. However, any future utilities occupying the proposed utility corridors would be required to comply with all CWA requirements. There will be no change in the existing management of the reservoir that would impact water quality.

NHPA of 1966, as amended – Compliance with the NHPA of 1966, as amended, requires identification of all properties in the project area listed in, or eligible for listing in, the NRHP. All previous surveys and site salvages were coordinated with the Texas State Historic Preservation Officer. Known sites are mapped and avoided by maintenance activities. Areas that have not undergone cultural resources surveys or evaluations will need to do so prior to any earthmoving or other potentially impacting activities.

Clean Air Act of 1977, as amended – The USEPA established nationwide air quality standards to protect public health and welfare. Existing operation and management of the reservoir is compliant with the Clean Air Act and will not change with the 2019 MP revision.

FPPA of 1980 and 1995 – The FPPA's purpose is to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses. There are Prime Farmland and farmland of state importance on Joe Pool Lake project lands, but these will not be significantly impacted.

EO 11990, Protection of Wetlands, as amended – EO 11990 requires Federal agencies to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in executing Federal projects. The Proposed Action complies with EO 11990.

EO 11988, Floodplain Management, as amended – This EO directs Federal agencies to evaluate the potential impacts of proposed actions in floodplains. The operation and management of the existing project complies with EO 11988.

CEQ Memorandum dated August 11, 1980, Prime or Unique Farmlands – Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. The Proposed Action would not impact Prime Farmland present on Joe Pool Lake project lands.

EO 12898, Environmental Justice – This EO directs Federal agencies to achieve environmental justice to the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report on the National Performance Review. Agencies are required to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. The revisions in the 2019 MP will not result in a disproportionate adverse impact on minority or low-income population groups.

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SECTION 6: IRRETRIEVABLE AND IRREVERSIBLE COMMITMENT OF RESOURCES

NEPA requires that Federal agencies identify “any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented” (42 U.S.C. § 4332). An irreversible commitment of resources occurs when the primary or secondary impacts of an action result in the loss of future options for a resource. Usually, this is when the action affects the use of a nonrenewable resource or it affects a renewable resource that takes a long time to regenerate. The impacts for this project from the reclassification of land would not be considered an irreversible commitment because subsequent MP revisions could result in some lands being reclassified to a prior, similar land classification. An irretrievable commitment of resources is typically associated with the loss of productivity or use of a natural resource (e.g., loss of production or harvest). No irreversible or irretrievable impacts on federally protected species or their habitat is anticipated from implementing revisions to the Joe Pool Lake MP.

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SECTION 7: PUBLIC AND AGENCY COORDINATION

In accordance with 40 CFR §§1501.7, 1503, and 1506.6, the USACE initiated public involvement and agency scoping activities to solicit input on the revision of the 1981 MP, as well as identifying reclassification proposals and significant issues related to the Proposed Action. The USACE began its public involvement process with a public scoping meeting to provide an avenue for public and agency stakeholders to ask questions and provide comments. This public scoping meeting was held on 23 May 2017 at the Summit Activity Center in Grand Prairie, Texas. The USACE, Fort Worth District, placed advertisements on the USACE webpage, social media, and print publications prior to the public scoping meeting.

A second public meeting was held on July 31, 2018 at the Summit Activity Center in Grand Prairie, Texas. This meeting introduced the public to the draft MP and EA and began the 30-day public review period of the MP, EA and draft Finding of No Significant Impact (FONSI). As with the first public meeting, USACE, Fort Worth District, placed advertisements on the USACE webpage, and various social media sites sponsored by adjacent cities. In addition, news releases were sent to area newspapers.

At the close of the 30-day public review period on August 29, 2018, 10 individuals and 2 agencies provided comment on the draft MP, EA and draft FONSI. Attachment A includes the ads published in the local newspaper, the agency coordination letters, and the distribution list for the coordination letters. The EA was coordinated with agencies having legislative and administrative responsibilities for environmental protection. A copy of the correspondence from the agencies that provided comments and planning assistance for preparation of the MP and EA is also included in Attachment A. Please refer to Section 7.1 of the 2019 MP for a summary of comments received at the public meetings as well as the government response.

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SECTION 9: ACRONYMS/ABBREVIATIONS

%	Percent
°	Degrees
ac-ft	acre-feet
AQCR	Air Quality Control Region
BMP	Best Management Practice
BP	Before Present
CAP	Climate Action Plan
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CHSP	Cedar Hill State Park
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CO ₂ e	CO ₂ -equivalent
CRMP	Cultural Resources Management Plan
CWA	Clean Water Act
DSHS	Department of State Health Services (Texas)
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMS	Ecological Mapping System (TPWD)
EO	Executive Order
EP	Engineer Pamphlet
ER	Engineer Regulation
ERS	Environmental Radiation Surveillance
ESA	Environmentally Sensitive Area
F	Fahrenheit
FAA	Federal Aviation Administration
FONSI	Finding of No Significant Impact
GHG	Greenhouse Gas
GCWA	Golden-cheeked Warbler
gpm	gallons per minute
HDR	High Density Recreation
HTRW	Hazardous, Toxic, Radioactive Wastes
IFR	Inactive/Future Recreation
IPAC	Information for Planning and Consultation (USFWS)
LDR	Low Density Recreation
MP	Master Plan
MRML	Multiple Resource Management Lands
msl	mean sea level
NAAQS	National Ambient Air Quality Standards
NCTCOG	North Central Texas Council of Governments
NEPA	National Environmental Policy Act
NGVD	National Geodetic Vertical Datum
NHPA	National Historic Preservation Act
NO	Nitrogen Oxide
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRRS	National Recreation Reservation Service
NWI	National Wetlands Inventory (USFWS)
O ₃	Ozone
OAQPS	Office of Air Quality Planning and Standards

Pb	Lead
PCB	Polychlorinated Biphenyls
PCPI	Per Capita Personal Incomes
PL	Public Law
PM _{2.5}	Particulate Matter Less than 2.5 Microns
PM ₁₀	Particulate Matter Less than 10 Microns
PO	Project Operations
RM	River Mile
ROD	Record of Decision
RPEC	Regional Planning and Environmental Center
SGCN	Species of Greatest Conservation Need
SMU	Southern Methodist University
SO ₂	Sulfur Dioxide
SUPER	USACE Suite of Computer Programs
TCAP	Texas Conservation Action Plan
TCEQ	Texas Commission on Environmental Quality
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPWD	Texas Parks and Wildlife Department
TSWQS	Texas Surface Water Quality Standards
TXNDD	Texas Natural Diversity Database
U.S.	United States
U.S.C.	U.S. Code
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGCRP	U.S. Global Change Research Group
VOC	Volatile Organic Compounds
WHAP	Wildlife Habitat Appraisal Procedures
WM	Wildlife Management
VM	Vegetation Management
ZOI	Zone of Interest

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SECTION 10: LIST OF PREPARERS

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ATTACHMENT A: NEPA COORDINATION AND PUBLIC SCOPING



NEWS RELEASE

U.S. ARMY CORPS OF ENGINEERS

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For Immediate Release: NR 17-010
May 5, 2017

Contact: Clay Church, 817-886-1314
clayton.a.church@usace.army.mil

USACE to host public information meeting for Joe Pool Lake Master Plan Revision

FORT WORTH, Texas – Fort Worth District, U.S. Army Corps of Engineers representatives will host a public information meeting on May 23 to provide information and receive public input on an initiative to revise the Master Plan for Joe Pool Lake.

The May 23 meeting will be held at The Summit Activity Center, 2975 Esplanade, Grand Prairie, Texas. The meeting will begin with a brief presentation at 6 p.m., followed by an open house forum for individual one-on-one discussion with Corps representatives. The public can view maps, ask questions and provide comments about the master plan revision. Comment forms and instructions for making comments will be provided at the meeting. The formal presentation to be used at the meetings will be available shortly before the meeting on the USACE website at: <http://www.swf.usace.army.mil/About/Lakes-and-Recreation-Information/Master-Plan-Updates>

A Master Plan is defined by the Corps as the strategic land use management document that guides the comprehensive management and development of all recreational, natural, and cultural resources throughout the life of the water resource development project. In general, it defines "how" the resources will be managed for public use and resource conservation. Revision of the Master Plan will not address in detail the technical operational aspects of the reservoir related to the water supply or flood risk management missions of the project, nor will it address the Shoreline Management Policy Statement which governs vegetation modification of public land by adjacent landowners.

The Master Plan study area will include Joe Pool Lake proper and all adjacent recreational and natural resources properties under Corps administration, including the Federal lands currently leased to the City of Grand Prairie and to Texas Parks and Wildlife Department.

The current Master Plan for Joe Pool Lake was completed on June 28, 1979 to address the overall management of Federal lands at Joe Pool Lake. The Master Plan is in need of revision to address changes in regional land use, population, outdoor recreation trends and national USACE management policy. Key topics to be addressed in the revised Master Plan include revised land classifications, revised natural and recreational resource management objectives, utility corridors, recreation facility needs and special topics such as invasive species management. Public participation is critical to the successful revision of the Master Plan.

Questions pertaining to the proposed revision can be addressed to: Donald Wiese, CESWF-PEC-TP, U.S. Army Corps of Engineers, Fort Worth District, P.O. Box 17300, Fort Worth, TX 76102-0300, Phone: (817) 886-1568 or email: donald.n.wiese@usace.army.mil.

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About the Fort Worth District: The Fort Worth District, U.S. Army Corps of Engineers was established in 1950. The District is responsible for water resources development in two-thirds of Texas, and design and construction at military installations in Texas and parts of Louisiana and New Mexico. Visit the Fort Worth District Web site at: www.swf.usace.army.mil and SWF Facebook at: <https://www.facebook.com/usacefortworth/>

U.S. ARMY CORPS OF ENGINEERS – FORT WORTH DISTRICT
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FORT WORTH, TX 76102
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U.S. ARMY CORPS OF ENGINEERS

News Release

BUILDING STRONG[®]

For Immediate Release: NR
July, 2018

Contact: Denisha Braxton 817-886-1435
denisha.l.braxton@usace.army.mil

Corps to host public meeting for the Joe Pool Lake Master Plan revision

FORT WORTH, Texas – The Fort Worth District, U.S. Army Corps of Engineers (USACE) will be hosting a public meeting at **6:00 p.m** on **31 July 2018** to provide information and receive public input toward the final draft revision of the Master Plan for Joe Pool Lake.

The **31 July 2018** meeting will be held at the **Summit Activity Center, 2975 Esplanade, Grand Prairie, Texas 75052**

At the conclusion of a brief presentation there will be an opportunity for the public to view maps, ask questions and provide comments about the Joe Pool Lake Master Plan.

USACE defines the Master Plan as the strategic land use management document that guides the comprehensive management and development of all recreational, natural, and cultural resources throughout the life of the water resource development project. **Public participation is critical to the successful revision of the Master Plan.**

The Master Plan study area includes Joe Pool Lake proper and all adjacent recreational and natural resources properties under USACE administration. Joe Pool Lake is a multi-purpose reservoir constructed and managed for flood risk management, water supply, fish and wildlife, and recreation. The current Master Plan for Joe Pool Lake, dated February 1981 was the original Master Plan for the lake and has never been revised. The revision is needed to address changes in regional land use, population, outdoor recreation trends, and USACE management policy.

Key topics to be addressed in the revised Master Plan include revised land classifications, new natural and recreational resource management objectives, recreation facility needs, and special topics such as utility corridors and recreational boating. Revision of the Master Plan will **not** address in detail the technical operational aspects of the reservoir related to the water supply, flood risk management, or shoreline management permitting missions of the project.

Questions pertaining to the proposed revision can be addressed to: Donald Wiese, Project Manager, CESWF-PEC-TP, U.S. Army Corps of Engineers, Fort Worth District, P.O. Box 17300, Fort Worth, TX 76102-0300, (817) 886-1568.

About the Fort Worth District: The Fort Worth District, U.S. Army Corps of Engineers was established in 1950. The District is responsible for water resources development in two-thirds of Texas, and design and construction at military installations in Texas and parts of Louisiana and New Mexico. Visit the Fort Worth District Web site at: www.swf.usace.army.mil and SWF Facebook at: <http://www.facebook.com/pages/Fort-Worth-District-US-Army-Corps-of-Engineers/188083711219308>.

U.S. ARMY CORPS OF ENGINEERS – FORT WORTH DISTRICT
819 TAYLOR STREET
FORT WORTH, TX 76102
WWW.SWF.USACE.ARMY.MIL

Joe Pool – List of Stakeholders and Agencies

City of Grand Prairie

- afortune@gptx.org

Grand Prairie Parks

- rherold@gptx.org
- dstrawn@gptx.org

Grand Prairie Fire

- grodrigu@gptx.org

Grand Prairie Police

- cmartinez@gptx.org
- dblair@gptx.org

TPWD – Cedar Hill State Park

- joshua.choate@tpwd.texas.gov

TPWD

- tom.heger@tpwd.texas.gov
- julie.wicker@tpwd.texas.gov

Lynn Creek Marina

- larryw45@aol.com

Golden Triangle Radio Control Club

- popeyetaylor@hotmail.com

City of Cedar Hill

- greg.porter@cedarhilltx.com
- elias.sassoon@cedarhilltx.com

City of Mansfield

- karen.welborn@mansfieldtexas.gov

City of Midlothian

- chris.dick@midlothian.tx.us

City of Dallas

- sana.syed@dallascityhall.com

Dallas County, Pct 3

- cartricee.washington@dallascounty.org

Dallas County, Pct 4

- Elba.GarciaDDS@dallascounty.org

Dallas County

- ray.banks@dallascounty.org

- micah.baker@dallascounty.org

Tarrant County, Pct 2

- precinct2@tarrantcounty.com

Ellis County, Pct 4

- kyle.butler@co.ellis.tx.us

Trinity River Authority

- davisk@trinityra.org

Texas Department of Transportation

- mark.hull@txdot.gov

United States Environmental Protection Agency

- jansky.michael@epa.gov
- houston.robert@epa.gov

Texas Commission on Environmental Quality

- gregg.easley@tceq.texas.gov
- david.galindo@tceq.texas.gov

United States Fish and Wildlife Service

- sidney_puder@fws.gov
- debra_bills@fws.gov

Caddo Tribe

- tffourkiller@gmail.com

Wichita Tribe

- terri.parton@wichitatribe.com

Comanche Tribe

- margaretm@comanchenation.com

State Historic Preservation Office

- Mark.wolfe@thc.texas.gov
- Bill.martin@thc.texas.gov



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Joe Pool Lake Master Plan Revision

General Information

The Army Corps of Engineers (USACE), Fort Worth District, is revising the Joe Pool Lake Master Plan. The Master Plan is intended to serve as a comprehensive land and recreational management plan with a life span of 25 years. It guides the stewardship of natural and cultural resources and the provision of outdoor recreation facilities and opportunities to ensure sustainability of federal land associated with Joe Pool Lake.

About Joe Pool Lake

Joe Pool Lake is in the Trinity River Basin and is located in portions of Dallas, Tarrant and Ellis counties. The lake proper is bordered on the west and south by the City of Grand Prairie and on the east by the City of Cedar Hill. The primary missions of the lake are water conservation and flood risk reduction. The Trinity River Authority is controls the water supply aspect of Joe Pool Lake and was the local sponsor Secondary missions include environmental stewardship of natural and cultural resources and the provision of high quality outdoor recreation opportunities. The dam at Joe Pool Lake was completed in 1986 and official impoundment of water began that same year. At the conservation (normal) pool elevation of 522.0' NGVD, the lake covers 7,470 acres. Joe Pool Lake is home to the very popular Cedar Hill State Park operated by Texas Parks & Wildlife Department as well as Lynn Creek and Lloyd Parks operated by the City of Grand Prairie.



Fast Facts about Joe Pool Lake

- Surface acres at normal pool: 7,470
- Acres of land above normal pool: 7,452
- Surface acres at top of flood pool: 10,940
- Miles of shoreline at normal pool: 60

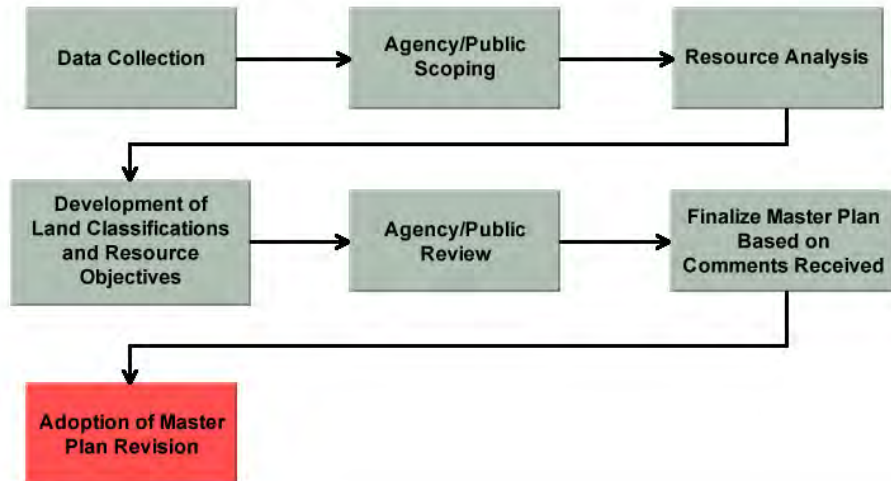
What is a Master Plan?

The Master Plan is the strategic land use management document that guides the comprehensive management and development of all project recreational, natural, and cultural resources throughout the life of the water resources project.

Why Revise the Joe Pool Lake Master Plan?

The current Master Plan for Joe Pool Lake was prepared in the 1979 – 81 time frame. Since then many changes have taken place including major utility and highway construction, a shift in park operations from the Trinity River Authority to the City of Grand Prairie, and expansion of Cedar Hill State Park to the north. The Plan and the land classifications are in need of revision to address changes in regional land use, population, outdoor recreation trends and USACE management policy. Key topics to be addressed in the revised Master Plan include revised land classifications, new natural and recreational resource management objectives, recreation facility needs and special topics such as invasive species management and protection of sensitive wildlife habitat. Public participation is critical to the successful revision of the Master Plan.

The Master Planning Process



Related Files

July 31, 2018 Public Meeting

- Comment Form with Map
- Draft - Master Plan
- Public Meeting - Meeting Presentation

May 23, 2017 Public Meeting

- Comment Form with Map
- Comment Form Instructions
- Public Meeting - Meeting Presentation (2.7 MB)

1981 Master Plan

- Master Plan (Revised) - Design Memorandum NO. 11, February 1981 (19.1 MB)

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Public Input Meeting for Update to Joe Pool Lake Master Plan

Tuesday, May 23, 2017

The U. S. Army Corps of Engineers is hosting this public meeting to share information and collect input for revisions to the Joe Pool Lake Master Plan. the strategic land use management document that guides the comprehensive management and development of all recreational, natural, and cultural resources throughout the life of the water resource development project. In general, it defines "how" the resources will be managed for public use and resource conservation.

Date: May 23, 2017

Time: 6:00 pm

Time Details: The meeting begins at 6 pm

Address: Summit Activity Center
2975 Esplanade
Grand Prairie, TX

Cost: This is a free event open to the public.

Link: [Corps of Engineers Release](#)





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U.S. Army Corps of Engineers to Host Public Meeting on Joe Pool Lake Master Plan



Joe Pool Lake Photo Credit: City of Grand Prairie

Do you enjoy boating, fishing or other recreational activities at Joe Pool Lake near Arlington's southeastern border? The U.S. Army Corps of Engineers will host a public meeting at 6 p.m. on Tuesday, July 31, 2018, to provide information and receive public input toward the final draft revision of the Master Plan for Joe Pool Lake.

The meeting will be held at the Summit Activity Center, 2975 Esplanade, in Grand Prairie.

At the conclusion of a brief presentation there will be an opportunity for the public to view maps, ask questions and provide comments about the Joe Pool Lake Master Plan. The U.S. Army Corps of Engineers defines the Master Plan as the strategic land use management document that guides the comprehensive management and development of all recreational, natural, and cultural resources throughout the life of the water resource development project. Public participation is critical to the successful revision of the Master Plan.

The Master Plan study area includes Joe Pool Lake proper and all adjacent recreational and natural resources properties under U.S. Army Corps of Engineers' administration. Joe Pool Lake is a multi-purpose reservoir constructed and managed for flood risk management, water supply, fish and wildlife, and recreation. The current Master Plan for Joe Pool Lake, dated February 1981, was the original Master Plan for the lake and has never been revised. The revision is needed to address changes in regional land use, population, outdoor recreation trends, and U.S. Army Corps of Engineers' management policy.

Key topics to be addressed in the revised Master Plan include revised land classifications, new natural and recreational resource management objectives, recreation facility needs, and special topics such as utility corridors and recreational boating. Revision of the Master Plan will not address in detail the technical operational aspects of the reservoir related to the water supply, flood risk management, or shoreline management permitting missions of the project.

Questions pertaining to the proposed revision can be addressed to: Donald Wiese, Project Manager, at 817-866-1568 or by mail to:

Donald Wiese, Project Manager CESWF-PEC-TP
U.S. Army Corps of Engineers, Fort Worth District
P.O. Box 17300
Fort Worth, TX 76102-0300.



DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102-0300

July 27, 2018

NOTICE OF AVAILABILITY

DRAFT MASTER PLAN AND ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED U.S. ARMY CORPS OF ENGINEERS 2018 JOE POOL LAKE MASTER PLAN DALLAS, ELLIS, AND TARRANT COUNTIES, TEXAS

The U.S. Army Corps of Engineers (USACE) Fort Worth District hereby informs the public of the release of the draft 2018 Joe Pool Master Plan (hereafter Plan), draft Environmental Assessment (EA) and Finding of No Significant Impact (FONSI).

The Plan is a vital tool produced and used by USACE to guide the responsible stewardship of USACE-administered lands and resources for the benefit of present and future generations. The Plan provides direction for appropriate management, use, development, enhancement, protection, and conservation of the natural, cultural, and manmade resources at Joe Pool Lake. The Plan presents an inventory and analysis of land resources, resource management objectives, land use classifications, resource use plan for each land use classification, current and projected park facility needs, an analysis of existing and anticipated resource use, and anticipated influences on overall project operation and management. Prior to this proposed Plan revision, the current Plan for Joe Pool Lake was approved in February 1981.

The draft Plan, draft EA and FONSI will be available for download starting July 31, 2018 at the following Fort Worth District website:

<http://www.swf.usace.army.mil/About/LakesandRecreationInformation/MasterPlanUpdates.aspx>

A hard copy of the report will be available for review at the following location:

Summit Activity Center, 2975 Esplanade, Grand Prairie, Texas 75052.

A public meeting will be held on July 31, 2018 at The Summit Activity Center, 2975 Esplanade, Grand Prairie, TX 75052. A brief overview of proposed changes will be presented at 6 p.m., followed by an opportunity to view maps, ask questions, and provide written comments about the project. The USACE will accept written public comments on the draft Plan, draft EA and FONSI for a 30-day public comment period beginning on July 31, 2018 and running through August 29, 2018. Comments on the report must be postmarked by August 29, 2018.

You may send written comments or questions to Mr. Don Wiese, USACE, Regional Planning and Environmental Center, Master Planning Section, 819 Taylor Street, Room 3B10, Fort Worth, TX 76102, or via email at joepool-mp@usace.army.mil.

A handwritten signature in black ink, appearing to read "D. Sims".

Douglas C. Sims, PMP, RPA
Chief, Environmental Compliance Branch
Regional Planning and Environmental Center



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September 17, 2018

Mr. Don Wiese, Project Manager
CESWF-PEC-TP
U.S. Army Corps of Engineers-Fort Worth District
P.O. Box 17300
Fort Worth, Texas 76102-0300

Re: Joe Pool Lake – Final Draft of the Lake Master Plan Revision and
Environmental Assessment (Dallas, Tarrant, and Ellis Counties, Texas)

Dear Mr. Don Wiese:

The Texas Parks and Wildlife Department (TPWD) received the July 2018 announcement regarding the availability for public and agency input on the final draft of the Joe Pool Lake - Lake Master Plan Revision (Plan) and Environmental Assessment (EA).

Project Description

The Joe Pool Dam and Lake Project (Project) consists of 6,707 acres of water surface at a conservation pool elevation of 522.0 feet, approximately 8,686 acres of fee-simple Federal land above the conservation pool, 1,904 acres of flowage easements, and approximately 60 miles of shoreline. The U.S. Army Corps of Engineers (USACE) Fort Worth District operates and maintains the dam and associated facilities and administers the Federal lands and flowage easements comprising the Project through a combination of direct management and leases for park and recreation purposes.

The USACE has proposed the 2018 Plan to replace the 1981 Plan to guide the responsible stewardship and sustainability of USACE-administered resources for the benefit of present and future generations. The Plan provides direction for appropriate management, use, development, enhancement, protection, and conservation of the natural, cultural, and man-made resources at Joe Pool Lake. The Plan presents an inventory and analysis of project resources, management goals, resource objectives, land allocation and classification, and a resource use framework for each land use classification. The plan includes the current and projected park facility needs, an analysis of existing and anticipated resource use, and anticipated influences on overall project operation and management.

As a result of stakeholder input and assessing project resources, proposed land classifications include project operations (308 acres), high density recreation (HDR) (4,139 acres), environmentally sensitive areas (ESA) (1,507 acres), and 2,734 acres of multiple resource management lands (MRML) which are sub-classified as low density recreation (482 acres), vegetation management (VM) (157 acres), and wildlife management (2,095 acres). Water surface classifications proposed at Joe

Pool Lake include restricted water surface (24 acres), designated no-wake water surface (103 acres), and open recreation water surface (6,580 acres).

The EA evaluated a no action alternative and the proposed Plan alternative. The EA indicates that the USACE has chosen the proposed action alternative because the proposed action would meet regional goals associated with good stewardship of land and water resources, would meet regional recreational goals, and would allow for continued use and development of Project lands without violating national policies or public laws.

TPWD's Role and Review

TPWD has two roles in review of the Plan and EA. As the state agency with primary responsibility for protecting the state's fish and wildlife resources and in accordance with the authority granted by Parks and Wildlife Code §12.0011, TPWD has a role in reviewing the environmental impacts of federal actions in Texas in association with the National Environmental Policy Act of 1969 (NEPA). As a state resource agency and under NEPA, TPWD's natural resource review encompasses the entire Joe Pool Lake Project area. Because TPWD holds a lease with the USACE to operate the 1,943-acre Cedar Hill State Park (SP) within Project lands, TPWD also has a role in reviewing the Plan with respect to lands within Cedar Hill SP, as a lessee and manager of Cedar Hill SP for public recreation.

TPWD State Parks Division

TPWD State Parks Division worked closely with the USACE in evaluating and classifying lands within Cedar Hill SP and identified areas within Cedar Hill SP for classification as HDR, ESA, and MRMI – VM for native prairie habitat restoration. For a number of years, a commercial marina operated under a sublease agreement with TPWD in the north end of Cedar Hill SP. The marina closed and all facilities were removed in 2017. TPWD requested to retain the authority to place another marina at the lake as replacement for the marina that was removed in 2017. The Plan indicates a need for a comprehensive water-related recreation boating study prior to making a decision to approve or deny a proposal for additional slips or boat ramp parking spaces at Joe Pool Lake. The Plan indicates that an exception to this requirement is the possible placement of a commercial marina in Cedar Hill SP to replace a marina that was removed in 2017.

Comment: Based on TPWD State Parks Division review, the plan appropriately classifies the lands within Cedar Hill SP.

TPWD Wildlife Division

TPWD's Wildlife Division – Wildlife Habitat Assessment Program, with responsibility of providing input under NEPA, has reviewed the Plan and EA for potential impacts to natural resources within the Project area and to guide conservation-minded recreational development at Joe Pool Lake. Because of the

Mr. Don Wiese
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similarity of the content in the Plan and EA, the following comments and recommendations regarding the Plan are also applicable to the EA.

The City of Grand Prairie (Grand Prairie) leases seven parcels at Joe Pool Lake including three developed parks and four undeveloped parks totaling 3,450 acres classified as HDR. Including portions of Cedar Hill SP, 4,139 acres are classified as HDR within the Project. The Plan indicates that each park has a conceptual development proposal that requires USACE review and approval prior to any item being developed. The Plan indicates that Grand Prairie's undeveloped Este Park would be the most robust park with future development as a 1,234-acre comprehensive resort.

TPWD natural resources review of the Plan indicates that areas within lands classified as HDR contain sensitive natural resources such as deciduous and mixed forests, vegetated shorelines, species rich grasslands, and riparian forests. Because the design details regarding future development of parks at Joe Pool Lake are not presented in the Plan, future development actions would be assessed by USACE on a project-by-project basis to ensure that environmental impacts have been evaluated and that the proposed development follows the policies for environmental stewardship and sustainability at the lake.

Recommendation: Because there are sensitive resources within HDR sites that are not given an ESA or MRML land classification, TPWD recommends that future development within HDR areas include an assessment of environmental impacts on a project-specific basis to be coordinated for TPWD review. TPWD recommends that future development follows a limited-footprint design that avoids, minimizes, or mitigates impacts to sensitive resources. Sensitive environmental resources may include, but are not limited to, vegetated shorelines that protect the lake from erosion, stream and riparian corridors, species rich grasslands, deciduous and mixed forest, wetlands, cultural resources, and aesthetic shorelines.

Recommendation: TPWD recommends that future development considers the potential impacts that structure height and lighting may have on viewsheds from the lake and on migrating birds. TPWD recommends that future development utilizes the minimum amount of night-time lighting needed for safety and security. TPWD recommends utilizing dark-sky friendly lighting that is on only when needed, down-shielded, as bright as needed, and minimizes blue light emissions. Appropriate lighting technologies may be found at the International Dark-Sky Association website.

Recommendation: TPWD recommends avoiding or minimizing the removal of shoreline vegetation that provides a visual screen between development and lake users and protects the shoreline from erosion.

Recommendation: TPWD recommends that future development retains forest corridors to accommodate wildlife and passive use trails, such as the trail to circumnavigate the lake that USACE, TPWD, and Grand Prairie have expressed a common interest in pursuing.

Recommendation: TPWD recommends that future development incorporates native landscaping that is drought tolerant and provides floral resources for pollinators.

Master Plan Chapter 2 – Project Setting and Factors Influencing Management and Development: As a result of road development on Joe Pool Lake fee simple lands, the Texas Department of Transportation (TXDOT) and the City of Cedar Hill in cooperation with TPWD, conducted habitat mitigation on USACE property within Cedar Hill SP. TPWD State Parks Division staff indicate that the TXDOT and City of Cedar Hill mitigation areas occur on lands classified as ESA under the 2018 Plan. However, the Plan does not recognize that TXDOT and City of Cedar Hill mitigation occurred within the Project area or the location of the mitigation. Knowledge of the TXDOT and City of Cedar Hill mitigation areas and their locations is important information when considering future planning and development.

Recommendation: TPWD recommends that the Plan identify the areas on Cedar Hill SP used for TXDOT and City of Cedar Hill mitigation for impacts to Joe Pool Lake fee simple lands as a result of highway development.

Master Plan Table ES.1 and Table 8.1: Under the column of new land classifications of Table ES.1, there is an entry of 1,475 acres that is not given a land classification. Chapter 4 indicates there are 1,475 acres of land acquired for and allocated to recreation, referred to as Separable Recreation Lands, and that allocations are different than land classifications. Table 8.1 is very similar to Table ES.1 and adds a footnote regarding 1,475 acres of Separable Recreation Lands as being included in the acreage totals for Recreation – High Use and Recreation – High Use/Interim Wildlife under the prior classification. However, by the manner in which the acres are presented in the tables, it is not clear that the acreage of Separable Recreation Lands is a value already included in the tabulation of the land classifications. It seems appropriate that the 1,475 acres of lands acquired and allocated for recreation should not be listed as a separate entry under the column of land classification acres.

Recommendation: TPWD recommends utilizing the notations of Table 8.1 in Table ES.1 and correcting Table ES.1 and Table 8.1 to reflect the land classifications appropriately.

Recommendation: Because the values of Separable Recreation Lands is already included in the land classification acres, then TPWD recommends no value for Separable Recreation Lands be placed in the column of acres of land classifications, since it isn't actually a land classification. Perhaps the tabulation of prior land classifications could provide a line as follows in parenthesis: (Recreation – High Use and Recreation – High Use/Interim Wildlife land classifications include 1,475 acres of lands allocated as Separable Recreation Lands²). Perhaps the tabulation of new land classifications could provide a line

as follows: (High Density Recreation, Environmentally Sensitive Areas, and Multiple Resource Management – Vegetative Management include 1,475 acres of lands allocated as Separable Recreation Lands²). Or have a separate footnote indicating that 1,475 acres of lands allocated as Separable Recreation Lands are classified within Recreation – High Use or Recreation – High Use/Interim Wildlife under the prior management plan and are classified within High Density Recreation, Environmentally Sensitive Areas, and Multiple Resource Management – Vegetation Management under the new management plan. TPWD finds it appropriate for Separable Recreation Lands to be classified under any of the new land classifications because some level of recreation is allowed in each land classification.

Master Plan Page 2-14, Line 866: The narrative references Table 2.6 as the table of acreage types of vegetation classes, but should reference Table 2.5.

Master Plan Table 2.7: The black-capped vireo (*Vireo atricapilla*) was federally-delisted effective May 16, 2018 and should be removed from Table 2.7.

Master Plan Table 2.8: The bald eagle (*Haliaeetus leucocephalus*) should be added to Table 2.8 as a state-listed threatened species potentially occurring in the Joe Pool Lake Federal Fee Boundary.

Master Plan Page 2-10, Line 970 and Table 2.9: The plan indicates that Table 2.9 lists many of the invasive species found at Joe Pool Lake. The TexasInvasives.org current map of lakes in Texas testing positive or infested with zebra mussels (*Dreissena polymorpha*) does not identify Joe Pool Lake. Additionally, the TexasInvasives.org map for giant salvinia (*Salvinia molesta*) does not include Joe Pool Lake. TPWD recommends the narrative and Table 2.9 indicate that the invasive species are those potentially occurring at Joe Pool Lake, with a notation of invasive species known to occur.

Master Plan Page 2-41, Line 1571: The document refers to Canyon Lake providing amenities for San Antonio, Houston, and Austin. TPWD recommends referring to Joe Pool Lake and surrounding cities.

Master Plan Appendix A: Land Classification, Managing Agencies, and Recreation Maps: Utility Corridor 7, depicted on the Utility Corridor Map, occurs within the same area that is classified as ESA on Land Classification Map Sheet 08. Hollings Branch is identified as a perennial stream on U.S. Geological Survey maps and occurs within the southern portion of Utility Corridor 7. The ESA classification is likely due to the presence of Hollings Branch and its associated riparian forest and woodland corridor. The Utility Corridor Map does not depict any of the named streams occurring on the east side of the lake, thus it is hard to determine the location of Hollings Branch with respect to Utility Corridor 7 in the Plan. Although the Utility Corridor Map does not identify the location of the existing sewer within Utility Corridor 7, aerial imagery indicates that the existing sewer may exit Utility Corridor 7 prior to reaching the southern end of Utility Corridor 7. TPWD questions whether it is appropriate to extend Utility Corridor 7 to the southern boundary where

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Hollings Branch and associated habitats could be impacted by future utility development.

Recommendation: TPWD recommends depicting named streams on the east side of the lake on the maps for Utility Corridors and Park Development Status in Appendix A and confirming that the location of Utility Corridor 7 is appropriate to avoid potential impacts of future utility development on Hollings Branch and associated habitats.

Master Plan Appendix A – Land Classification, Managing Agencies, and Recreation Maps: The map sheets depicting the land classifications in Appendix A show a land classification designated as Specific Recreation Lands.

Recommendation: If Specific Recreation Lands represent the lands allocated as Separable Recreation Lands, then TPWD recommends that the map sheets depict a separate heading for Allocation Lands which identify Separable Recreation Lands using the terminology of the Plan narrative.

TPWD generally supports the proposed action alternative of the EA and revisions to the Plan. The Plan would create a balance between recreational opportunity and stewardship of the natural resources at Joe Pool Lake. The importance of recreation and habitat conservation have been well addressed, as have the discussions regarding species of concern and invasive species. Key changes include the newly-incorporated environmentally sensitive areas, a reduction in intensive use recreation areas, and a new distribution of lands classified for low density recreation, wildlife habitat, and vegetation management.

Thank you for conserving the fish and wildlife resources of Texas and considering TPWD's input on the Plan and EA. Mr. Brandon Wadlington, USACE, indicated that TPWD could submit our comments for USACE consideration by mid-September. Please contact me at Karen.Hardin@tpwd.texas.gov or Mr. Adam Jarrett, the Regional Director for State Parks Region 6, at Adam.Jarrett@tpwd.texas.gov if you have any questions.

Sincerely,



Karen B. Hardin
Wildlife Habitat Assessment Program
Wildlife Division

Kbh;jn 40403(38015)

cc: Mr. Adam Jarrett - TPWD

APPENDIX C – WILDLIFE DOCUMENTS

TRUST RESOURCES REPORT – USFWS

OFFICIAL SPECIES LIST – USFWS

LIST OF SGCN SPECIES

WHAP REPORT



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Arlington Ecological Services Field Office

2005 Ne Green Oaks Blvd

Suite 140

Arlington, TX 76006-6247

Phone: (817) 277-1100 Fax: (817) 277-1129

<http://www.fws.gov/southwest/es/arlingtontexas/>

<http://www.fws.gov/southwest/es/EndangeredSpecies/lists/>

In Reply Refer To:

May 30, 2018

Consultation Code: 02ETAR00-2018-SLI-0502

Event Code: 02ETAR00-2018-E-02440

Project Name: Joe Pool Lake Master Plan

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, which may occur within the boundary of your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under section 7(a)(1) of the Act, Federal agencies are directed to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Under and 7(a)(2) and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether their actions may affect threatened and endangered species and/or designated critical habitat. A Federal action is an activity or program authorized, funded, or carried out, in whole or in part, by a Federal agency (50 CFR 402.02).

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For Federal actions other than major construction activities, the Service suggests that a biological evaluation (similar to a Biological Assessment) be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

After evaluating the potential effects of a proposed action on federally listed species, one of the following determinations should be made by the Federal agency:

1. *No effect* - the appropriate determination when a project, as proposed, is anticipated to have no effects to listed species or critical habitat. A "no effect" determination does not require section 7 consultation and no coordination or contact with the Service is necessary. However, the action agency should maintain a complete record of their evaluation, including the steps leading to the determination of affect, the qualified personnel conducting the evaluation, habitat conditions, site photographs, and any other related information.
2. *May affect, but is not likely to adversely affect* - the appropriate determination when a proposed action's anticipated effects are insignificant, discountable, or completely beneficial. Insignificant effects relate to the size of the impact and should never reach the scale where "take" of a listed species occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not be able to meaningfully measure, detect, or evaluate insignificant effects, or expect discountable effects to occur. This determination requires written concurrence from the Service. A biological evaluation or other supporting information justifying this determination should be submitted with a request for written concurrence.
3. *May affect, is likely to adversely affect* - the appropriate determination if any adverse effect to listed species or critical habitat may occur as a direct or indirect result of the proposed action, and the effect is not discountable or insignificant. This determination requires formal section 7 consultation.

The Service recommends that candidate species, proposed species, and proposed critical habitat be addressed should consultation be necessary. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: <http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan (<http://www.fws.gov/windenergy/>)

[eagle_guidance.html](#)). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

For additional information concerning migratory birds and eagle conservation plans, please contact the Service's Migratory Bird Office at 505-248-7882.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Arlington Ecological Services Field Office

2005 Ne Green Oaks Blvd

Suite 140

Arlington, TX 76006-6247

(817) 277-1100

Project Summary

Consultation Code: 02ETAR00-2018-SLI-0502

Event Code: 02ETAR00-2018-E-02440

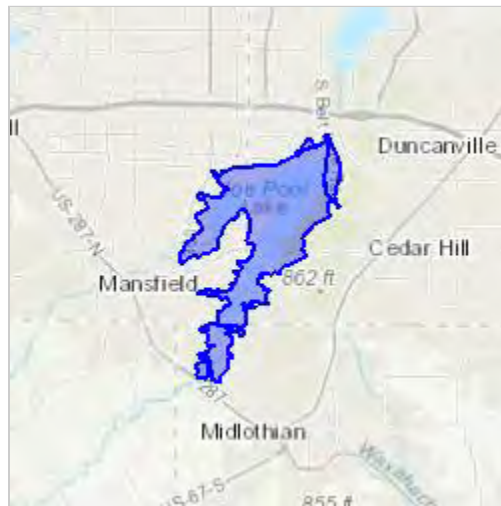
Project Name: Joe Pool Lake Master Plan

Project Type: LAND - MANAGEMENT PLANS

Project Description: USACE is currently in the process of revising the master plan for Joe Pool, this species list will be used in developing the plan.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/32.600263833216616N97.01638911604545W>



Counties: Dallas, TX | Ellis, TX | Tarrant, TX

Endangered Species Act Species

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 2 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.
-

Birds

NAME	STATUS
<p>Golden-cheeked Warbler (=wood) <i>Dendroica chrysoparia</i></p> <p>No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/33</p>	Endangered
<p>Least Tern <i>Sterna antillarum</i></p> <p>Population: interior pop. No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8505</p>	Endangered
<p>Piping Plover <i>Charadrius melodus</i></p> <p>Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is final critical habitat for this species. Your location is outside the critical habitat. This species only needs to be considered under the following conditions:</p> <ul style="list-style-type: none"> ▪ Wind Energy Projects <p>Species profile: https://ecos.fws.gov/ecp/species/6039</p>	Threatened
<p>Red Knot <i>Calidris canutus rufa</i></p> <p>No critical habitat has been designated for this species. This species only needs to be considered under the following conditions:</p> <ul style="list-style-type: none"> ▪ Wind Energy Projects <p>Species profile: https://ecos.fws.gov/ecp/species/1864</p>	Threatened
<p>Whooping Crane <i>Grus americana</i></p> <p>Population: Wherever found, except where listed as an experimental population There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/758</p>	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

TEXAS BLACKLAND PRAIRIES SPECIES OF GREATEST CONSERVATION NEED								
Scientific Name	Common Name	Status		Abundance Ranking		General Habitat Type(s) in Texas These are VERY broad habitat types as a starting place State of the practice resources are listed in each taxa line for more detailed information	Other Notes	Endemic in Texas
		Federal	State	Global	State			
MAMMALS								
<i>Blarina hylophaga plumblea</i>	Elliot's short-tailed shrew			G5T1Q	S1	Savanna/Open Woodland		N
<i>Geomys attwateri</i>	Attwater's pocket gopher			G4	S4	Shrubland		Y
<i>Lutra canadensis</i>	River otter			G5	S4	Riparian	Appendix II, CITES	N
<i>Mustela frenata</i>	Long-tailed weasel			G5	S5	Forest, Woodland, Desert Scrub, Shrubland, Savanna/Open Woodland	Statewide	N
<i>Myotis austroriparius</i>	Southeastern myotis			G3G4	S3	Caves/Karst, Forest, Riparian		N
<i>Myotis velifer</i>	Cave myotis			G5	S4	Caves/Karst,		N
<i>Puma concolor</i>	Mountain lion			G5	S2	Forest, Woodland, Desert Scrub, Shrubland, Savanna/Open Woodland, Riparian	Statewide	N
<i>Spilogale putorius</i>	Eastern spotted skunk			G4T	S4	Savanna/Open Woodland, Grassland		N
<i>Sylvilagus aquaticus</i>	Swamp rabbit			G5	S5	Riparian, Freshwater Wetland		N
<i>Tadarida brasiliensis</i>	Brazilian free-tailed bat			G5	S5	Cave/Karst, Artificial Refugia	Statewide	N
<i>Taxidea taxus</i>	American badger			G5	S5	Grassland, Desert scrub, Woodland, Savanna/Open Woodland, Forest		N
<i>Ursus americanus</i>	Black bear	SAT	T	G5	S3	Forest, Woodland, Savanna/Open Woodland, Desert Scrub, Shrubland	see also Louisiana black bear; may overlap with Louisiana black bear in TBPR, ECPL	N
Mammals References:								
W.B. Davis and D.J. Schmidly. 1997 and 1994. Mammals of Texas (online and in print). Texas Tech University (1997) and Texas Parks and Wildlife Department (1994). http://www.nsrll.ttu.edu/tmot1/Default.htm (accessed 2011)								
BIRDS								
BIRDS ONLY: instead of endemism these numbers are for taxonomic sorting								
<i>Ammodramus henslowii</i>	Henslow's Sparrow			G4	S2S3N,SX B	Grassland, Savanna/Open Woodland	Winter	100
<i>Ammodramus leconteii</i>	Le Conte's Sparrow					Grassland	Winter	101
<i>Ammodramus savannarum</i>	Grasshopper Sparrow			G5	S3B	Grassland, Agricultural	Year-round	97
<i>Anas acuta</i>	Northern Pintail			G5	S3B,S5N	Lacustrine, freshwater wetland, saltwater wetland, coastal, marine	Winter	2
<i>Anthus spragueii</i>	Sprague's Pipit	C		G4	S3N	Barren/Sparse Vegetation, Grassland, Shrubland, Agricultural	Winter	80
<i>Asio flammeus</i>	Short-eared Owl			G5	S4N	Grassland, Shrubland, Agricultural	Winter	65
<i>Buteo lineatus</i>	Red-shouldered Hawk			G5	S4B	Woodland, Forest, Riparian, Freshwater Wetland	Year-round	26
<i>Butorides virescens</i>	Green Heron			G5	S5B	Riparian, Riverine, Lacustrine, Freshwater Wetland, Cultural Aquatic	Breeding	16
<i>Calcarius mccownii</i>	McCown's Longspur			G4	S4	Grassland, Agricultural	Winter, TBPR (northern), ECPL (northern)	104
<i>Calcarius pictus</i>	Smith's Longspur					Grassland, Agricultural	Winter	105
<i>Caprimulgus carolinensis</i>	Chuck-will's-widow			G5	S3S4B	Woodland, Forest, Riparian	Breeding	66
<i>Charadrius montanus</i>	Mountain Plover	PT		G3	S2	Agricultural, Grassland	Winter	43
<i>Chondestes grammacus</i>	Lark Sparrow			G5	S4B	Grassland, Shrubland, Savanna/Open Woodland	Year-round	98
<i>Circus cyaneus</i>	Northern Harrier			G5	S2B,S3N	Grassland, Shrubland	Year-round	23

Texas Blackland Prairies Ecoregion Species of Greatest Conservation Need

Scientific Name	Common Name	Status		Abundance Ranking		General Habitat Type(s) in Texas These are VERY broad habitat types as a starting place State of the practice resources are listed in each taxa line for more detailed information	Other Notes	Endemic in Texas
		Federal	State	Global	State			
<i>Cistothorus platensis</i>	Sedge Wren			G5	S4	Grassland, Freshwater Wetland	Winter	78
<i>Colinus virginianus</i>	Northern Bobwhite			G5	S4B	Grassland, Shrubland, Savanna/Open Woodland	deleted for CHIH	4
<i>Dendroica dominica</i>	Yellow-throated Warbler			G5	S4B	Woodland, Forest, Riparian	Breeding	84
<i>Dryocopus pileatus</i>	Pileated Woodpecker			G5	S4B	Savanna/Open Woodland, Woodland, Forest, Riparian, Developed: Urban/Suburban/Rural	Year-round	69
<i>Egretta caerulea</i>	Little Blue Heron			G5	S5B	Riparian, Riverine, Lacustrine, Freshwater Wetland, Saltwater Wetland, Estuary, Coastal, Cultural Aquatic	Breeding	13
<i>Egretta thula</i>	Snowy Egret			G5	S5B	Riparian, Riverine, Lacustrine, Freshwater Wetland, Saltwater Wetland, Estuary, Coastal, Cultural Aquatic	Breeding	12
<i>Euphagus carolinus</i>	Rusty Blackbird			G4	S3	Woodland, Forest, Riparian, Lacustrine, Freshwater Wetland	Winter	110
<i>Haliaeetus leucocephalus</i>	Bald Eagle			G5	S3B,S3N	Riparian, Lacustrine, Freshwater Wetland, Saltwater Wetland	Year-round, added CRTB	22
<i>Hylocichla mustelina</i>	Wood Thrush			G5	S4B	Woodland, Forest, Riparian	Breeding	79
<i>Icterus spurius</i>	Orchard Oriole			G5	S4B	Shrubland, Savanna/Open Woodland, Woodland, Riparian	Breeding	111
<i>Ictinia mississippiensis</i>	Mississippi Kite			G5	S4B	Woodland, Forest, Riparian, Developed: Urban/Suburban/Rural	Breeding	20
<i>Ixobrychus exilis</i>	Least Bittern			G5	S4B	Lacustrine, Freshwater Wetland, Saltwater Wetland, Estuary	Breeding	11
<i>Lanius ludovicianus</i>	Loggerhead Shrike			G4	S4B	Desert Scrub, Grassland, Shrubland, Savanna/Open Woodland, Agricultural, Developed	Year-round	73
<i>Limnothlypis swainsonii</i>	Swainson's Warbler			G4	S3B	Woodland, Forest, Riparian	Breeding	88
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker			G5	S3B	Savanna/Open Woodland, Woodland, Forest, Riparian, Developed: Urban/Suburban/Rural	Year-round	67
<i>Meleagris gallopavo</i>	Wild Turkey			G5	S5B	Shrubland, Savanna/Open Woodland, Forest, Riparian, Agricultural	Year-round, added <i>merriami</i> for CHIH	8
<i>Mycteria americana</i>	Wood Stork		T	G4	SHB,S2N	Riverine, Freshwater wetland	Migrant	18
<i>Oporornis formosus</i>	Kentucky Warbler			G5	S3B	Woodland, Forest	Breeding	90
<i>Passerina ciris</i>	Painted Bunting			G5	S4B	Shrubland, Agricultural	Breeding	107
<i>Piranga rubra</i>	Summer Tanager			G5	S5B	Urban/Suburban/Rural	Breeding	106
<i>Pluvialis dominica</i>	American Golden-Plover			G5	S3	Grassland, Freshwater Wetland, Agricultural	Migrant	39
<i>Poecile carolinensis</i>	Carolina Chickadee			G5	S5B	Woodland, Forest, Riparian, Developed: Urban/Suburban/Rural	Year-round	76
<i>Protonotaria citrea</i>	Prothonotary Warbler			G5	S3B	Woodland, Forest, Riparian, Lacustrine, Freshwater Wetland	Breeding	86
<i>Scolopax minor</i>	American Woodcock			G5	S2B,S3N	Woodland, Forest, Riparian	Winter (some breeding during that time)	51
<i>Seiurus motacilla</i>	Louisiana Waterthrush			G5	S3B	Woodland, Forest, Riparian	Breeding	89
<i>Spiza americana</i>	Dickcissel			G5	S4B	Grassland, Agricultural	Breeding	108
<i>Spizella pusilla</i>	Field Sparrow			G5	S5B	Grassland, Shrubland, Savanna/Open Woodland	Year-round	96
<i>Sternula antillarum</i>	Least Tern	LE*	E*	G4	S3B	Riverine, Lacustrine, Freshwater Wetland, Saltwater Wetland, Estuary, Coastal, Marine, Developed: Industrial	Year-round; subspecies <i>athalassos</i>	54
<i>Sturnella magna</i>	Eastern Meadowlark			G5	S5B	Grassland, Shrubland, Savanna/Open Woodland	Year-round; subspecies <i>lilliana</i> added for CHIH	109
<i>Thryomanes bewickii (bewickii)</i>	Bewick's Wren			G5	S5B	Shrubland, Savanna/Open Woodland, Woodland, Developed: Urban/Suburban/Rural	Year-round, red-backed form only	77
<i>Tympanuchus cupido</i>	Greater Prairie-Chicken (Interior)			G4	S1B	Grassland	Year-round	6
<i>Tyrannus forficatus</i>	Scissor-tailed Flycatcher			G5	S3B	Desert Scrub, Grassland, Shrubland, Agricultural, Developed	Breeding	71
<i>Vireo bellii</i>	Bell's Vireo			G5	S3B	Desert scrub, Shrubland, Riparian	Breeding	74
<i>Zonotrichia querula</i>	Harris's Sparrow			G5	S4	Shrubland, Agricultural	Winter	103

Texas Blackland Prairies Ecoregion Species of Greatest Conservation Need

Scientific Name	Common Name	Status		Abundance Ranking		General Habitat Type(s) in Texas These are VERY broad habitat types as a starting place State of the practice resources are listed in each taxa line for more detailed information	Other Notes	Endemic in Texas
		Federal	State	Global	State			

Birds References:
 The Birds of North America Online (A. Poole, Ed.). 2005 (with current updates by species). Retrieved from The Birds of North America Online database:
<http://bna.birds.cornell.edu/BNA/> (accessed 2011). Supported by information from the Cornell Lab of Ornithology and the American Ornithologists' Union (<http://www.aou.org/>).

REPTILES AND AMPHIBIANS

<i>Anaxyrus (Bufo) woodhousii</i>	Woodhouse's toad			G5	SU	Woodland, Forest, Freshwater Wetland		N
<i>Apalone mutica</i>	smooth softshell turtle					Riparian, Riverine, Lacustrine, Freshwater Wetland	added	N
<i>Apalone spinifera</i>	spiny softshell turtle					Riparian, Riverine, Lacustrine, Freshwater Wetland	added, not AZNM	N
<i>Cheylydra serpentina</i>	Common snapping turtle					Riparina, Riverine	added	N
<i>Crotalus atrox</i>	Western diamondback rattlesnake				S4	Barren/Sparse Vegetation, Desert Scrub, Grassland, Shrubland, Savanna, Woodland, Caves/Karst		N
<i>Crotalus horridus</i>	Timber (Canebrake) Rattlesnake		T	G4	S4	Woodland, Forest, Riparian		N
<i>Graptemys caglei</i>	Cagle's map turtle		T	G3	S1	Riparina, Riverine		Y
<i>Graptemys versa</i>	Texas map turtle			G4	SU	Riparina, Riverine		Y
<i>Heterodon nasicus</i>	Western hognosed snake					Desert Scrub, Grassland, Shrubland	added	N
<i>Macrochelys temminckii</i>	alligator snapping turtle		T	G3G4	S3	Riparian, Riverine, Cultural Aquatic	added	N
<i>Ophisaurus attenuatus</i>	western slender glass lizard					Grassland, Savanna	added	N
<i>Phrynosoma cornutum</i>	Texas horned lizard		T	G4G5	S4	Desert Srub, Grassland, Savanna		N
<i>Pseudacris streckeri</i>	Strecker's Chorus Frog			G5	S3	Grassland, Savanna, Woodland, Riparian, Cultural Aquatic, Freshwater Wetland		N
<i>Sistrurus catenatus</i>	massasauga					Grassland, Barren/Sparse Vegetation, Shrubland, Coastal,	added	N
<i>Terrapene carolina</i>	Eastern box turtle			G5	S3	Grasslands, Savanna, Woodland		N
<i>Terrapene ornata</i>	Ornate box turtle			G5	S3	Grassland, Barren/Sparse Vegetation, Deset Scrub, Savanna, Woodland		N
<i>Thamnophis sirtalis annectans</i>	Texas Garter Snake (Eastern/Texas/ New Mexico)			G5	S2	Riparian, Around Lacustrine and Cultural Aquatic Sites		Y
<i>Trachemys scripta</i>	Red-eared slider					Riparian, Riverine, Lacustrine, Freshwater Wetland, Cultural Aquatic	added	N

Reptiles and Amphibians References:
 J.E. Werler and J.R. Dixon. 2000. Texas Snakes: Identification, Distribution, and Natural History. University of Texas Press, Austin. 519 pgs.
 J.R. Dixon. 1987. Amphibians and Reptiles of Texas. Texas A&M University Press, College Station. 434 pp.

FRESHWATER FISHES Range in Texas, as known

Texas Blackland Prairies Ecoregion Species of Greatest Conservation Need

Scientific Name	Common Name	Status		Abundance Ranking		General Habitat Type(s) in Texas These are VERY broad habitat types as a starting place State of the practice resources are listed in each taxa line for more detailed information	Other Notes	Endemic in Texas
		Federal	State	Global	State			
<i>Anguilla rostrata</i>	American eel			G4	S5	Streams and reservoirs in drainages connected to marine environments	Originally found in large rivers from the Red River to the Rio Grande; Red River (from the mouth upstream to and including the Kiamichi River), Sabine Lake (including minor coastal drainages west to Galveston Bay), Galveston Bay (including minor coastal drainages west to mouth of Brazos River), Brazos River, Colorado River, San Antonio Bay (including minor coastal drainages west of mouth of Colorado River to mouth of Nueces River), Nueces River. Extirpated in several drainages (dams)	N
<i>Atractosteus spatula</i>	alligator gar					Near surface habitats in slack water and backwater habitats of rivers. Preferred pool, pool-bank snag, pool-channel snag, pool-snag complex, pool-edge, and pool-vegetation habitat	Red River (from the mouth upstream to and including the Kiamichi River), Sabine Lake (including minor coastal drainages west to Galveston Bay), Galveston Bay (including minor coastal drainages west to mouth of Brazos River), Brazos River, Colorado River, San Antonio Bay (including minor coastal drainages west of mouth of Colorado River to mouth of Nueces River), Nueces River	N
<i>Cyprinella elongatus</i>	Blue sucker		T	G3G4	S3	Large, deep rivers, and deeper zones of lakes	Red River (from the mouth upstream to and including the Kiamichi River), Sabine Lake (including minor coastal drainages west to Galveston Bay), Galveston Bay (including minor coastal drainages west to mouth of Brazos River), Brazos River, Colorado River, San Antonio Bay (including minor coastal drainages west of mouth of Colorado River to mouth of Nueces River), Nueces River	N
<i>Etheostoma fonticola</i>	Fountain darter	LE	E	G1	S1	Thermally constant (21-24 °C) springs and the upper San Marcos (Hays Co.) and Comal (Comal Co.) rivers, usually in dense beds of <i>Vallisneria</i> , <i>Elodia</i> , <i>Ludwigia</i> and other aquatic plants; substrate normally mucky	Upper San Marcos (Hays Co.) and Comal (Comal Co.) rivers, San Antonio Bay drainage unit Note: original population in the Comal River extirpated in mid-1950's when Comal Springs ceased to flow; a population from San Marcos was reintroduced into Comal Springs in 1975	Y

Texas Blackland Prairies Ecoregion Species of Greatest Conservation Need

Scientific Name	Common Name	Status		Abundance Ranking		General Habitat Type(s) in Texas These are VERY broad habitat types as a starting place State of the practice resources are listed in each taxa line for more detailed information	Other Notes	Endemic in Texas
		Federal	State	Global	State			
<i>Macryhbopsis storeriana</i>	Silver chub					Broad rivers with low gradient which flow through old mature valley; bottoms gravel to silt, but more common over silt or mud, turbid water with very soft sand/silt substrate Normally inhabits pools, will move to riffle if siltation is heavy; when large streams very turbid or depositing unusually large amounts of silt, will temporarily migrate into clearer streams of higher gradients; when waters were very clear individuals move to deeper water	Red River and the lower Brazos River; Brazos River population is apparently disjunct from other populations of this species, which range through the Mississippi River Basin to Mobile Bay	N
<i>Micropterus treculii</i>	Guadalupe bass			G3	S3	Small lentic environments; commonly taken in flowing water	Endemic to the streams of the northern and eastern Edwards Plateau including portions of the Brazos, Colorado, Guadalupe, and San Antonio basins; species also found outside of the Edwards Plateau streams in decreased abundance, primarily in the lower Colorado River; two introduced populations have been established in the Nueces River system	Y
<i>Notropis atrocaudalis</i>	Blackspot shiner					More abundant near headwaters; runs and pools over all types of substrates, generally avoiding areas of backwater and swiftest currents	Red River (from the mouth upstream to and including the Kiamichi River), Sabine Lake (including minor coastal drainages west to Galveston Bay), Galveston Bay (including minor coastal drainages west to mouth of Brazos River), and Brazos River	N
<i>Notropis bairdi</i>	Red River shiner					Turbid waters of broad, shallow channels of main stream, over bottom mostly of silt and shifting sand; streambeds with widely fluctuating flows subject to high summer temperatures, high rates of evaporation, and high concentrations of dissolved solids; tolerant of high salinities	Red River, from the mouth upstream to and including the Kiamichi River	N
<i>Notropis buccula</i>	Small eye shiner	C		G2Q	S2	Turbid waters of broad, sandy channels of main stream, over substrate consisting mostly of shifting sand; broad condition tolerances (turbidity, salinity, oxygen).	Brazos River; historically as far south as Hempstead (Waller County)	Y
<i>Notropis chalybaeus</i>	Ironcolor shiner					Small to medium sized streams that drain pine woodlands; acid, tannin-stained, non-turbid sluggish Coastal Plain streams and rivers of low to moderate gradient; often at the upstream ends of pools, with a moderate to sluggish current, and sand, mud, silt, or detritus substrata; usually associated with aquatic vegetation; in the San Marcos River (Hays Co.), a disjunct population is restricted to clear, spring-fed waters with abundant aquatic vegetation	Red River (from the mouth upstream to and including the Kiamichi River), Sabine Lake (including minor coastal drainages west to Galveston Bay), San Antonio Bay (including minor coastal drainages west of mouth of Colorado River to mouth of Nueces River, isolated population found in the San Marcos River headwaters)	N

Texas Blackland Prairies Ecoregion Species of Greatest Conservation Need

Scientific Name	Common Name	Status		Abundance Ranking		General Habitat Type(s) in Texas These are VERY broad habitat types as a starting place State of the practice resources are listed in each taxa line for more detailed information	Other Notes	Endemic in Texas
		Federal	State	Global	State			
<i>Notropis oxyrhynchus</i>	Sharpnose shiner	C		G3	S3	Moderate current velocities and depths, sand bottom	Brazos River drainage; Red River drainage, when a tributary to the Brazos River was captured into the Red River drainage; introduced in Colorado River drainage	Y
<i>Notropis potteri</i>	Chub shiner		T	G4	S3	Turbid, flowing water with silt or sand substrate; tolerant of high salinities	Brazos River, Colorado River, San Jacinto River, Trinity Rivers, and Galveston Bay	N
<i>Notropis shumardi</i>	Silverband shiner					Large rivers, smaller tributaries and oxbow lakes that frequently reconnect to Brazos River mainstem; main channel with moderate to swift current velocities and moderate to deep depths; associated with turbid water over silt, sand, and gravel; tolerant of high turbidity	Red River (from the mouth upstream to and including the Kiamichi River), Sabine Lake (including minor coastal drainages west to Galveston Bay), Galveston Bay (including minor coastal drainages west to mouth of Brazos River), Brazos River, and Colorado River	N
<i>Percina apristis</i>	Guadalupe darter					Riffles; most common under or around boulders in the main current; moderately turbid water; absent in collections from the clearest waters tributary to the Guadalupe, namely spring heads and the main river west of Kerrville	Guadalupe River and its tributaries, the San Marcos and Blanco Rivers; apparently absent from the headwaters of the Blanco and the entirety of the San Antonio River	Y
<i>Polyodon spathula</i>	Paddlefish		T	G4	S3	Large river systems and tributaries; deepwater channel habitats; low-gradient areas of moderate to large-sized rivers, sluggish pools, backwaters, bayous, and oxbows with abundant zooplankton; large reservoirs if connected to/can access free-flowing streams in the spring for spawning	Historically occurred in Texas in every major river drainage from the Trinity Basin eastward; currently only Red River, from the mouth upstream to and including the Kiamichi River	N
<i>Satan eurystomus</i>	Widemouth blindcat		T	G1	S1	Karst: Subterranean waters	Restricted to 5 artesian wells penetrating the San Antonio Pool of the Edwards Aquifer (Edwards Limestone, Lower Cretaceous) in the vicinity of San Antonio (Bexar County)	Y
<i>Trogloglanis pattersoni</i>	Toothless blindcat		T	G1	S1	Karst: Subterranean waters	Restricted to 5 artesian wells penetrating the San Antonio Pool of the Edwards Aquifer (Edwards Limestone, Lower Cretaceous) in the vicinity of San Antonio (Bexar County)	Y
Freshwater Fish References:								
C. Thomas, T.H. Bonner and B.G. Whiteside. 2007. Freshwater Fishes of Texas: A Field Guide. Sponsored by The River Systems Institute at Texas State University, published by Texas A&M University Press.								
Editor's Note: All freshwater fishes life history information in this table was sourced directly from the online version; citations are embedded in the online version at http://www.bio.txstate.edu/~tbonner/txfishes/								
INVERTEBRATES								
<i>Bombus pensylvanicus</i>	American bumblebee			GU	SU*	Grassland, Savanna/Open Woodland	Terrestrial - Insect - Bee/Wasp/Ant	
<i>Chimarra holzenthali</i>	Holzenthali's Philopotamid caddisfly			G1G2	S1	Riparian, Riverine	Aquatic - Insects - Caddisflies; added TBPR, ECPL	
<i>Cotinis boylei</i>	A scarab beetle			G2*	S2*	Grassland, Shrubland, Woodland	Terrestrial - Insect - Beetles	
<i>Nicrophorus americanus</i>	American Burying Beetle	LE		G1	S1	Grassland, Savanna/Open Woodland	Terrestrial - Insect - Beetles	
<i>Potamilus amphichaenus</i>	Texas heelsplitter		T	G1G2	S1	Riverine	Aquatic - Freshwater - Mollusks; new state rank and threatened state status	
<i>Procambarus regalis</i>	Regal burrowing crayfish			G2G3	S2?*	Freshwater Wetland, Grassland	Aquatic - Crustaceans - Crayfish	

Texas Blackland Prairies Ecoregion Species of Greatest Conservation Need

Scientific Name	Common Name	Status		Abundance Ranking		General Habitat Type(s) in Texas These are VERY broad habitat types as a starting place State of the practice resources are listed in each taxa line for more detailed information	Other Notes	Endemic in Texas
		Federal	State	Global	State			
<i>Procambarus steigmani</i>	Parkhill prairie crayfish			G1G2	S1S2*	Freshwater Wetland, Grassland	Aquatic - Crustaceans - Crayfish	
<i>Pseudocentropiloides morihari</i>	A mayfly			G2G3	S2?*	Riverine, Riparian	Aquatic - Insects - Mayflies	
<i>Sphinx eremitoides</i>	Sage sphinx			G1G2	S1?*	Grassland	Terrestrial - Insect - Butterflies/Moths	
<i>Susperatus tonkawa</i>	A mayfly			G1	S1*	Riparian, Riverine	Aquatic - Insects - Mayflies	
Invertebrates References:								
www.bugguide.net – good tool for identification and taxonomic information.								
www.texasento.net – compilation of information on insects in Texas								
www.odonatacentral.org – resource for identification and distribution of damselflies and dragonflies								
www.butterfliesandmoths.org – resource for identification and distribution of Lepidoptera								
www.texasmussels.wordpress.com – resource for information on freshwater mussels in Texas								
Howells, R. G., R. W. Neck and H. D. Murray. 1996. Freshwater Mussels of Texas. Texas Parks and Wildlife Press, Austin.								
Burlakova, L. E., A. Y. Karatayev, V. A. Karatayev, M. E. May, D. L. Bennett and M. J. Cook. 2011. Biogeography and conservation of freshwater mussels (Bivalvia:Unionidae) in Texas: patterns of diversity and threats. Diversity and Distributions: 1-15.								
PLANTS								
<i>Agalinis densiflora</i>	Osage Plains false foxglove			G3	S2	Savanna/Open Woodland - Outcrops	Terrestrial	N
<i>Astragalus reflexus</i>	Texas milk vetch			G3	S3	Savanna/Open Woodland	Terrestrial	Y
<i>Calopogon oklahomensis</i>	Oklahoma grass pink			G3	S1S2	Savanna/Open Woodland; Grassland; Freshwater Wetland	Terrestrial	N
<i>Carex edwardsiana</i>	canyon sedge			G3G4S3S4	S3S4	Woodland (slopes above Riparian)	Wetland	Y
<i>Carex shinneryi</i>	Shinner's sedge			G3?	S2	Grassland	Wetland	N
<i>Crataegus dallasiana</i>	Dallas hawthorn			G3Q	S3	Riparian (creeks in the Blackland Prairie)	Terrestrial	Y
<i>Cuscuta exaltata</i>	tree dodder			G3	S3	Woodland	Terrestrial	N
<i>Dalea hallii</i>	Hall's prairie-clover			G3	S3	Savanna/Open Woodland; Grassland	Terrestrial	Y
<i>Echinacea atrorubens</i>	Topeka purple-coneflower			G3	S3	Savanna/Open Woodland	Terrestrial	N
<i>Hexalectris nitida</i>	Glass Mountains coral-root			G3	S3	Woodland	Terrestrial	N
<i>Hexalectris warnockii</i>	Warnock's coral-root			G2G3	S2	Woodland	Terrestrial	N
<i>Hymenoxys pygmaea</i>	Pygmy prairie dawn			G1	S1	Barren/Sparse Vegetation with Grassland matrix (saline prairie)	currently being described	Y
<i>Liatris glandulosa</i>	glandular gay-feather			G3	S3	Savanna/Open Woodland	Terrestrial	Y
<i>Paronychia setacea</i>	bristle nailwort			G3	S3	Savanna/Open Woodland	Terrestrial	Y
<i>Phlox oklahomensis</i>	Oklahoma phlox			G3	SH	Savanna/Open Woodland	Terrestrial	N
<i>Physaria engelmannii</i>	Engelmann's bladderpod			G3	S3	Savanna/Open Woodland	Terrestrial	Y
<i>Polygonella parksii</i>	Parks' jointweed			G2	S2	Savanna/Open Woodland (sandhills); Grassland	Terrestrial	Y
<i>Prunus texana</i>	Texas peachbush			G3G4	S3S4	Savanna/Open Woodland; Grassland	Terrestrial	Y
<i>Thalictrum texanum</i>	Texas meadow-rue			G2	S2	Savanna/Open Woodland; Riparian (bottomland forest)	Terrestrial	Y
<i>Zizania texana</i>	Texas wild rice	LE	E	G1	S1	Riverine (spring-fed, clear, thermally constant, moderate current, sand to gravel substrate)	Aquatic	Y

DALLAS COUNTY

BIRDS

		Federal Status	State Status
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	DL	T
<p>year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in US and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.</p>			
Arctic Peregrine Falcon	<i>Falco peregrinus tundrius</i>	DL	
<p>migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.</p>			
Bald Eagle	<i>Haliaeetus leucocephalus</i>	DL	T
<p>found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds</p>			
Black-capped Vireo	<i>Vireo atricapilla</i>	DL	E
<p>oak-juniper woodlands with distinctive patchy, two-layered aspect; shrub and tree layer with open, grassy spaces; requires foliage reaching to ground level for nesting cover; return to same territory, or one nearby, year after year; deciduous and broad-leaved shrubs and trees provide insects for feeding; species composition less important than presence of adequate broad-leaved shrubs, foliage to ground level, and required structure; nesting season March-late summer</p>			
Golden-cheeked Warbler	<i>Setophaga chrysoparia</i>	LE	E
<p>juniper-oak woodlands; dependent on Ashe juniper (also known as cedar) for long fine bark strips, only available from mature trees, used in nest construction; nests are placed in various trees other than Ashe juniper; only a few mature junipers or nearby cedar brakes can provide the necessary nest material; forage for insects in broad-leaved trees and shrubs; nesting late March-early summer</p>			
Henslow's Sparrow	<i>Ammodramus henslowii</i>		
<p>wintering individuals (not flocks) found in weedy fields or cut-over areas where lots of bunch grasses occur along with vines and brambles; a key component is bare ground for running/walking</p>			
Interior Least Tern	<i>Sternula antillarum athalassos</i>	LE	E
<p>The subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony</p>			
Peregrine Falcon	<i>Falco peregrinus</i>	DL	T
<p>both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (F. p. anatum) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, F.p. tundrius is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.</p>			

DALLAS COUNTY

BIRDS

		Federal Status	State Status
Piping Plover	<i>Charadrius melodus</i>	LT	T
wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats			
Red Knot	<i>Calidris canutus rufa</i>	LT	
Red knots migrate long distances in flocks northward through the contiguous United States mainly April-June, southward July-October. A small plump-bodied, short-necked shorebird that in breeding plumage, typically held from May through August, is a distinctive and unique pottery orange color. Its bill is dark, straight and, relative to other shorebirds, short-to-medium in length. After molting in late summer, this species is in a drab gray-and-white non-breeding plumage, typically held from September through April. In the non-breeding plumage, the knot might be confused with the omnipresent Sanderling. During this plumage, look for the knot's prominent pale eyebrow and whitish flanks with dark barring. The Red Knot prefers the shoreline of coast and bays and also uses mudflats during rare inland encounters. Primary prey items include coquina clam (<i>Donax</i> spp.) on beaches and dwarf surf clam (<i>Mulinia lateralis</i>) in bays, at least in the Laguna Madre. Wintering Range includes- Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kennedy, Kleberg, Matagorda, Nueces, San Patricio, and Willacy. Habitat: Primarily seacoasts on tidal flats and beaches, herbaceous wetland, and Tidal flat/shore.			
Sprague's Pipit	<i>Anthus spragueii</i>		
only in Texas during migration and winter, mid September to early April; short to medium distance, diurnal migrant; strongly tied to native upland prairie, can be locally common in coastal grasslands, uncommon to rare further west; sensitive to patch size and avoids edges.			
Western Burrowing Owl	<i>Athene cunicularia hypugaea</i>		
open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows			
White-faced Ibis	<i>Plegadis chihi</i>		T
prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats			
Whooping Crane	<i>Grus americana</i>	LE	E
potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties			
Wood Stork	<i>Mycteria americana</i>		T
forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960			

INSECTS

		Federal Status	State Status
Black Lordithon rove beetle	<i>Lordithon niger</i>		
historically known from Texas			

DALLAS COUNTY

REPTILES

	Federal Status	State Status
Timber rattlesnake <i>Crotalus horridus</i>		T
swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay; prefers dense ground cover, i.e. grapevines or palmetto		

PLANTS

	Federal Status	State Status
Glass Mountains coral-root <i>Hexalectris nitida</i>		
GLOBAL RANK: G3; Apparently rare in mixed woodlands in canyons in the mountains of the Brewster County, but encountered with regularity, albeit in small numbers, under <i>Juniperus ashei</i> in woodlands over limestone on the Edwards Plateau, Callahan Divide and Lampasas Cutplain; Perennial; Flowering June-Sept; Fruiting July-Sept		
Glen Rose yucca <i>Yucca necopina</i>		
Texas endemic; grasslands on sandy soils and limestone outcrops; flowering April-June		
Hall's prairie clover <i>Dalea hallii</i>		
GLOBAL RANK: G3; In grasslands on eroded limestone or chalk and in oak scrub on rocky hillsides; Perennial; Flowering May-Sept; Fruiting June-Sept		
Osage Plains false foxglove <i>Agalinis densiflora</i>		
GLOBAL RANK: G3; Most records are from grasslands on shallow, gravelly, well drained, calcareous soils; Prairies, dry limestone soils; Annual; Flowering Aug-Oct		
Plateau milkvine <i>Matelea edwardsensis</i>		
GLOBAL RANK: G3 ; Occurs in various types of juniper-oak and oak-juniper woodlands; Perennial; Flowering March-Oct; Fruiting May-June		
Texas milk vetch <i>Astragalus reflexus</i>		
GLOBAL RANK: G3; Grasslands, prairies, and roadsides on calcareous and clay substrates; Annual; Flowering Feb-June; Fruiting April-June		
Tree dodder <i>Cuscuta exaltata</i>		
GLOBAL RANK: G3; Parasitic on various <i>Quercus</i> , <i>Juglans</i> , <i>Rhus</i> , <i>Vitis</i> , <i>Ulmus</i> , and <i>Diospyros</i> species as well as <i>Acacia berlandieri</i> and other woody plants; Annual; Flowering May-Oct; Fruiting July-Oct		
Warnock's coral-root <i>Hexalectris warnockii</i>		
in leaf litter and humus in oak-juniper woodlands on shaded slopes and intermittent, rocky creekbeds in canyons; in the Trans Pecos in oak-pinyon-juniper woodlands in higher mesic canyons (to 2000 m [6550 ft]), primarily on igneous substrates; in Terrell County under <i>Quercus fusiformis</i> mottes on terraces of spring-fed perennial streams, draining an otherwise rather xeric limestone landscape; on the Callahan Divide (Taylor County), the White Rock Escarpment (Dallas County), and the Edwards Plateau in oak-juniper woodlands on limestone slopes; in Gillespie County on igneous substrates of the Llano Uplift; flowering June-September; individual plants do not usually bloom in successive years		

ELLIS COUNTY

AMPHIBIANS

Federal Status

State Status

Southern Crawfish Frog *Lithobates areolatus areolatus*

The Southern Crawfish Frog can be found in abandoned crawfish holes and small mammal burrows. This species inhabits moist meadows, pasturelands, pine scrub, and river flood plains. This species spends nearly all of its time in burrows and only leaves the burrow area to breed. Although this species can be difficult to detect due to its reclusive nature, the call of breeding males can be heard over great distances. Eggs are laid and larvae develop in temporary water such as flooded fields, ditches, farm ponds and small lakes. Habitat: Shallow water, Herbaceous Wetland, Riparian, Temporary Pool, Cropland/hedgerow, Grassland/herbaceous, Suburban/orchard, Woodland – Conifer.

BIRDS

Federal Status

State Status

American Peregrine Falcon *Falco peregrinus anatum*

DL

T

year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in US and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.

Arctic Peregrine Falcon *Falco peregrinus tundrius*

DL

migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.

Bald Eagle *Haliaeetus leucocephalus*

DL

T

found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds

Golden-cheeked Warbler *Setophaga chrysoparia*

LE

E

juniper-oak woodlands; dependent on Ashe juniper (also known as cedar) for long fine bark strips, only available from mature trees, used in nest construction; nests are placed in various trees other than Ashe juniper; only a few mature junipers or nearby cedar brakes can provide the necessary nest material; forage for insects in broad-leaved trees and shrubs; nesting late March-early summer

Henslow's Sparrow *Ammodramus henslowii*

wintering individuals (not flocks) found in weedy fields or cut-over areas where lots of bunch grasses occur along with vines and brambles; a key component is bare ground for running/walking

Interior Least Tern *Sternula antillarum athalassos*

LE

E

The subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony

ELLIS COUNTY

BIRDS

		Federal Status	State Status
Peregrine Falcon	<i>Falco peregrinus</i>	DL	T
<p>both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (F. p. anatum) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, F.p. tundrius is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.</p>			
Red Knot	<i>Calidris canutus rufa</i>	LT	
<p>Red knots migrate long distances in flocks northward through the contiguous United States mainly April-June, southward July-October. A small plump-bodied, short-necked shorebird that in breeding plumage, typically held from May through August, is a distinctive and unique pottery orange color. Its bill is dark, straight and, relative to other shorebirds, short-to-medium in length. After molting in late summer, this species is in a drab gray-and-white non-breeding plumage, typically held from September through April. In the non-breeding plumage, the knot might be confused with the omnipresent Sanderling. During this plumage, look for the knot's prominent pale eyebrow and whitish flanks with dark barring. The Red Knot prefers the shoreline of coast and bays and also uses mudflats during rare inland encounters. Primary prey items include coquina clam (<i>Donax</i> spp.) on beaches and dwarf surf clam (<i>Mulinia lateralis</i>) in bays, at least in the Laguna Madre. Wintering Range includes- Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kennedy, Kleberg, Matagorda, Nueces, San Patricio, and Willacy. Habitat: Primarily seacoasts on tidal flats and beaches, herbaceous wetland, and Tidal flat/shore.</p>			
Sprague's Pipit	<i>Anthus spragueii</i>		
<p>only in Texas during migration and winter, mid September to early April; short to medium distance, diurnal migrant; strongly tied to native upland prairie, can be locally common in coastal grasslands, uncommon to rare further west; sensitive to patch size and avoids edges.</p>			
Western Burrowing Owl	<i>Athene cunicularia hypugaea</i>		
<p>open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows</p>			
White-faced Ibis	<i>Plegadis chihi</i>		T
<p>prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats</p>			
Whooping Crane	<i>Grus americana</i>	LE	E
<p>potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties</p>			
Wood Stork	<i>Mycteria americana</i>		T
<p>forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960</p>			

ELLIS COUNTY

MAMMALS

	Federal Status	State Status
Plains spotted skunk <i>Spilogale putorius interrupta</i> catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie		
Red wolf <i>Canis rufus</i> extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies	LE	E

MOLLUSKS

	Federal Status	State Status
Louisiana pigtoe <i>Pleurobema riddellii</i> streams and moderate-size rivers, usually flowing water on substrates of mud, sand, and gravel; not generally known from impoundments; Sabine, Neches, and Trinity (historic) River basins		T
Sandbank pocketbook <i>Lampsilis satura</i> small to large rivers with moderate flows and swift current on gravel, gravel-sand, and sand bottoms; east Texas, Sulfur south through San Jacinto River basins; Neches River		T
Texas heelsplitter <i>Potamilus amphichaenus</i> quiet waters in mud or sand and also in reservoirs. Sabine, Neches, and Trinity River basins		T
Texas pigtoe <i>Fusconaia askewi</i> rivers with mixed mud, sand, and fine gravel in protected areas associated with fallen trees or other structures; east Texas River basins, Sulphur River, Cypress Creek, Sabine through Trinity rivers as well as San Jacinto River		T

REPTILES

	Federal Status	State Status
Alligator snapping turtle <i>Macrochelys temminckii</i> perennial water bodies; deep water of rivers, canals, lakes, and oxbows; also swamps, bayous, and ponds near deep running water; sometimes enters brackish coastal waters; usually in water with mud bottom and abundant aquatic vegetation; may migrate several miles along rivers; active March-October; breeds April-October		T
Texas garter snake <i>Thamnophis sirtalis annectens</i> wet or moist microhabitats are conducive to the species occurrence, but is not necessarily restricted to them; hibernates underground or in or under surface cover; breeds March-August		
Texas horned lizard <i>Phrynosoma cornutum</i> open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September		T
Timber rattlesnake <i>Crotalus horridus</i>		T

ELLIS COUNTY

REPTILES

Federal Status

State Status

swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay; prefers dense ground cover, i.e. grapevines or palmetto

PLANTS

Federal Status

State Status

Hall's prairie clover

Dalea hallii

GLOBAL RANK: G3; In grasslands on eroded limestone or chalk and in oak scrub on rocky hillsides; Perennial; Flowering May-Sept; Fruiting June-Sept

TARRANT COUNTY

BIRDS

		Federal Status	State Status
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	DL	T
<p>year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in US and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.</p>			
Arctic Peregrine Falcon	<i>Falco peregrinus tundrius</i>	DL	
<p>migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.</p>			
Bald Eagle	<i>Haliaeetus leucocephalus</i>	DL	T
<p>found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds</p>			
Henslow's Sparrow	<i>Ammodramus henslowii</i>		
<p>wintering individuals (not flocks) found in weedy fields or cut-over areas where lots of bunch grasses occur along with vines and brambles; a key component is bare ground for running/walking</p>			
Interior Least Tern	<i>Sternula antillarum athalassos</i>	LE	E
<p>The subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony</p>			
Peregrine Falcon	<i>Falco peregrinus</i>	DL	T
<p>both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (F. p. anatum) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, F.p. tundrius is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.</p>			

TARRANT COUNTY

BIRDS

Federal Status State Status

Red Knot

Calidris canutus rufa

LT

Red knots migrate long distances in flocks northward through the contiguous United States mainly April-June, southward July-October. A small plump-bodied, short-necked shorebird that in breeding plumage, typically held from May through August, is a distinctive and unique pottery orange color. Its bill is dark, straight and, relative to other shorebirds, short-to-medium in length. After molting in late summer, this species is in a drab gray-and-white non-breeding plumage, typically held from September through April. In the non-breeding plumage, the knot might be confused with the omnipresent Sanderling. During this plumage, look for the knot's prominent pale eyebrow and whitish flanks with dark barring. The Red Knot prefers the shoreline of coast and bays and also uses mudflats during rare inland encounters. Primary prey items include coquina clam (*Donax* spp.) on beaches and dwarf surf clam (*Mulinia lateralis*) in bays, at least in the Laguna Madre. Wintering Range includes- Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kennedy, Kleberg, Matagorda, Nueces, San Patricio, and Willacy. Habitat: Primarily seacoasts on tidal flats and beaches, herbaceous wetland, and Tidal flat/shore.

Sprague's Pipit

Anthus spragueii

only in Texas during migration and winter, mid September to early April; short to medium distance, diurnal migrant; strongly tied to native upland prairie, can be locally common in coastal grasslands, uncommon to rare further west; sensitive to patch size and avoids edges.

Western Burrowing Owl

Athene cunicularia hypugaea

open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows

Whooping Crane

Grus americana

LE

E

potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties

FISHES

Federal Status State Status

Shovelnose sturgeon

Scaphirhynchus platyrhynchus

T/SA

T

open, flowing channels with bottoms of sand or gravel; spawns over gravel or rocks in an area with a fast current; Red River below reservoir and rare occurrence in Rio Grande

MAMMALS

Federal Status State Status

Gray wolf

Canis lupus

LE

E

extirpated; formerly known throughout the western two-thirds of the state in forests, brushlands, or grasslands

Plains spotted skunk

Spilogale putorius interrupta

catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie

TARRANT COUNTY

MAMMALS

		Federal Status	State Status
Red wolf	<i>Canis rufus</i>	LE	E
extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies			

MOLLUSKS

		Federal Status	State Status
Louisiana pigtoe	<i>Pleurobema riddellii</i>		T
streams and moderate-size rivers, usually flowing water on substrates of mud, sand, and gravel; not generally known from impoundments; Sabine, Neches, and Trinity (historic) River basins			
Sandbank pocketbook	<i>Lampsilis satura</i>		T
small to large rivers with moderate flows and swift current on gravel, gravel-sand, and sand bottoms; east Texas, Sulfur south through San Jacinto River basins; Neches River			
Texas heelsplitter	<i>Potamilus amphichaenus</i>		T
quiet waters in mud or sand and also in reservoirs. Sabine, Neches, and Trinity River basins			
Texas pigtoe	<i>Fusconaia askewi</i>		T
rivers with mixed mud, sand, and fine gravel in protected areas associated with fallen trees or other structures; east Texas River basins, Sulphur River, Cypress Creek, Sabine through Trinity rivers as well as San Jacinto River			

REPTILES

		Federal Status	State Status
Texas garter snake	<i>Thamnophis sirtalis annectens</i>		
wet or moist microhabitats are conducive to the species occurrence, but is not necessarily restricted to them; hibernates underground or in or under surface cover; breeds March-August			
Texas horned lizard	<i>Phrynosoma cornutum</i>		T
open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September			
Timber rattlesnake	<i>Crotalus horridus</i>		T
swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay; prefers dense ground cover, i.e. grapevines or palmetto			

PLANTS

		Federal Status	State Status
Auriculate false foxglove	<i>Agalinis auriculata</i>		
Known in Texas from one late nineteenth century specimen record labeled -Benbrook-; in Oklahoma, degraded prairies, floodplains, fallow fields, and borders of upland sterile woods; in Arkansas, blackland prairie; Annual; Flowering August - October			

TARRANT COUNTY

PLANTS

Federal Status

State Status

Glen Rose yucca

Yucca necopina

Texas endemic; grasslands on sandy soils and limestone outcrops; flowering April-June

Hall's prairie clover

Dalea hallii

GLOBAL RANK: G3; In grasslands on eroded limestone or chalk and in oak scrub on rocky hillsides; Perennial; Flowering May-Sept; Fruiting June-Sept

Osage Plains false foxglove

Agalinis densiflora

GLOBAL RANK: G3; Most records are from grasslands on shallow, gravelly, well drained, calcareous soils; Prairies, dry limestone soils; Annual; Flowering Aug-Oct

Reverchon's curfpea

Pediomelum reverchonii

GLOBAL RANK: G3; Mostly in prairies on shallow rocky calcareous substrates and limestone outcrops; Perennial; Flowering Jun-Sept; Fruiting June-July

Texas milk vetch

Astragalus reflexus

GLOBAL RANK: G3; Grasslands, prairies, and roadsides on calcareous and clay substrates; Annual; Flowering Feb-June; Fruiting April-June

Topeka purple-coneflower

Echinacea atrorubens

GLOBAL RANK: G3; Occurring mostly in tallgrass prairie of the southern Great Plains, in blackland prairies but also in a variety of other sites like limestone hillsides; Perennial; Flowering Jan-June; Fruiting Jan-May

APPENDIX E
WILDLIFE HABITAT APPRAISAL PROCEDURE (WHAP) SUMMARY REPORT
JOE POOL MASTER PLAN
DALLAS, ELLIS, AND TARRANT COUNTIES, TEXAS



**US Army Corps
of Engineers®**
Fort Worth District

December 2017

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Introduction

Habitat assessments were conducted at Joe Pool Lake on October 2-5th, 2017 using Texas Parks and Wildlife Department's (TPWD) Wildlife Habitat Appraisal Procedure ([WHAP] TPWD 1995). WHAP survey point locations were haphazardly preselected based on aerial imagery from existing Geographical Information Systems (GIS) data. A total of 69 WHAP points were surveyed, all within U.S. Army Corps of Engineers (USACE) fee boundary (Figures 1A, 1B, and 1C).

The purpose of this report is to describe wildlife habitat quality within the USACE Joe Pool Lake fee-owned property in Dallas, Ellis, and Tarrant Counties, Texas. This report is being prepared by the USACE Regional Planning and Environmental Center to provide habitat quality information and inform land classifications as part of the Joe Pool Lake Master Plan revision process.

Study Area

USACE fee owned property at Joe Pool Lake, approximately 15,202 acres, is located within the Dallas-Fort Worth metroplex in north central Texas. More specifically, the lake sits primarily between the cities of Grand Prairie and Cedar Hill, Texas within the Texas Blackland Prairie ecoregion. Among numerous small creeks and tributaries, Mountain Creek and Walnut Creek are the major contributing streams to Joe Pool Lake. Downstream of the Joe Pool Lake dam, Mountain Creek meanders through Mountain Creek Lake before its confluence with the Trinity River.

Methodology

An interagency team of biologists, foresters, and USACE park rangers conducted the habitat surveys on October 2-5th, 2017. TPWD's WHAP protocol was used to analyze and describe existing habitats.

The WHAP requires evaluating representative sites of each cover type present within an area of interest. For this project, a search area of 0.1 acre (circle with radius of 37.2 feet) was used at each WHAP site to compile a list of plant species occurring at each site and to complete the Biological Components Field Evaluation Form (https://tpwd.texas.gov/publications/pwdpubs/media/pwd_rp_w7000_0145.pdf). Field data collected on the form at each WHAP site included the following components:

1. Site Potential
2. Temporal Development of Existing Successional Stage
3. Uniqueness and Relative Abundance
4. Vegetation Species Diversity
5. Vertical Vegetation Stratification
6. Additional Structural Diversity
7. Condition of Existing Vegetation

At each site, a 1/10th acre plot was evaluated and points were assigned to all applicable components based on field conditions. A habitat quality score, where values range from 0.0 (low quality) to 1.0 (high quality), was then calculated for each site by adding together all points and multiplying by 0.01. Habitat quality was then determined for all sites within the same habitat type.

Photographs were taken at each site and are included as Attachment B.

The TPWD developed the WHAP to allow a qualitative, holistic evaluation of wildlife habitat for particular tracts of land statewide without imposing significant time requirements in regard to field work and compilation of data (TPWD 1995). The WHAP was not designed to evaluate habitat quality in relation to specific wildlife species.

The WHAP is based on the following assumptions:

1. Vegetation structure including species composition and physiognomy is itself sufficient to define the habitat suitability for wildlife;
2. A positive relationship exists between vegetation diversity and wildlife species diversity;
3. Vegetation composition and primary productivity directly influence population densities of wildlife species.

As designed, the WHAP is intended to be used for the following applications:

1. Evaluating impacts upon wildlife populations from specific development project alternatives.
2. Establishing baseline data prior to anticipated or proposed changes in habitat conditions for specific areas.
3. Comparing tracts of land that are candidates for land acquisition or mitigation.
4. Evaluating general habitat quality and wildlife management potential for tracts of land over large geographical areas, including wildlife planning units.

The WHAP protocol can be used to assess a wide range of habitats, however it was originally developed to assess and develop mitigation requirements for loss of bottomland hardwoods and other aquatic habitats. Scores can screw higher for these habitats based on how the scoring is allotted to each WHAP habitat component. Upland forest and grassland habitat types cannot reach a score indicative of high quality habitat although they may exhibit high quality features. Subsequently, high quality upland habitat may not be identified or can be overlooked.

Grasslands, in particular, fall into this category. Consider the Site Potential component with a maximum score of 0.25 points, it allocates more points based on higher hydrologic connectivity. In order to receive the highest score for this component, the area must exhibit at least one of the following: at least periodically support predominately hydrophytic vegetation, is predominately undrained hydric soil and supports or is capable of supporting hydrophytic vegetation, and/or is saturated with water or covered by shallow water during 1-2 months during the growing season of each year. In a grassland setting, when conditions become conducive to hydrophytic plant growth, a successional shift from a grassland to herbaceous wetlands, swamps, or riparian forest is likely to occur. Therefore, grasslands would almost always be limited to a maximum score of 0.12 points (uplands with thick surface layer).

Similarly, grasslands would be limited to a maximum of 0.12 points for the Temporal Development of Existing Successional Stage component, whereas other forested habitats could receive the full 0.25 points.

These two components alone regularly exclude grassland habitat from receiving 0.26 points on the WHAP scale. In order to identify the maximum score each habitat type can receive, USACE environmental staff scored each criteria given ideal conditions for riparian/bottomland hardwood forest (BHF), upland forest (includes all non-riparian/BHF forests), grassland, swamp, and marsh habitats. The maximum values scores, shown in Table 1, were then used to normalize

scores for habitats that are prevented from reaching the maximum WHAP score primarily due to arbitrary low scores in the two WHAP components described above. Normalizing habitat scores will identify high quality habitat that would otherwise not be detected.

Table 1. Maximum Total Score per Habitat Type

Cover Type	Component Number								Maximum Total Score
	1	2	3	4	5	6	7	7B	
Swamp	20	20	20	20	5	5	5	5	1.00
Marsh	25	20	20	20	NA	5	10	NA	1.00
Riparian/BHF	25	20	20	15	5	5	5	5	1.00
Upland Forest	12	20	20	15	5	5	5	5	0.87
Grassland	12	12	20	6	3	5	5	5	0.68

Swamp, marsh, and riparian/BHF habitats can all achieve the maximum score, therefore, no normalization of scores were made for these habitat types. Upland forests and grasslands, however, can only reach within 0.13 and 0.32 points of the maximum WHAP score, even in ideal conditions.

To evaluate all habitat types on an even scoring basis, upland forest and grassland scores were normalized by dividing their original scores by the maximum possible score for their respective habitat types. For example, if a grassland site received an initial score of 0.42, it would be divided by the maximum total points a grassland site can receive, 0.68. The normalized total score used for further analysis for the grassland site would be 0.61.

This adjustment allows habitat type scores to be analyzed and compared to their corresponding habitat type maximum total score. Rather than, for instance, a grassland being evaluated on a bottomland hardwood scoring scale.

All WHAP scores analyzed and discussed from here forward reflect the normalized total scores. As mentioned above, swamp, marsh, and riparian/BHF habitats were not normalized as they can already achieve maximum scores. Grassland scores were normalized by dividing initial scores by 0.68, while all upland forest scores were normalized by dividing the initial score by 0.87.

Habitat

Using TPWD’s Texas Ecological Mapping Systems (<https://tpwd.texas.gov/landwater/land/programs/landscape-ecology/ems/>), Joe Pool Lake lies within the Texas Blackland Prairie ecoregion. The most common habitat types include Deciduous Forest, Grasslands, and Riparian Forest (Elliot, 2014). Table 2 displays all habitats surveyed and the number of points surveyed within each respective habitat type.

Table 2. Survey Points per Habitat Type	
Habitat Type	Points Surveyed
Mixed Forest	8
Deciduous Forest	25
Riparian Forest	15
Grassland	21
Total Points Surveyed	69

Elliot (2014) provided general habitat type descriptions and associated vegetation communities for the Ecological Systems Classification and Mapping Project in support of the Comprehensive Wildlife Conservation Strategy for the Texas Parks and Wildlife Department. These descriptions were meant to be broad and depict typical vegetative assemblages across vast areas as the observable vegetation communities can vary based on local conditions.

Historically, tallgrass prairies consisting of little bluestem, big bluestem, yellow Indiangrass, tall dropseed, eastern gamagrass and many forbs, such as asters, clovers, and black-eyed susan dominated the region. Before nearly all of the prairie was developed, bison and pronghorn, greater prairie chickens, and even ocelot utilized this area. Only an estimated 5,000 widely scattered acres in small tracts remain of the original 12 million acres of the region, or less than one-tenth of one percent of remaining prairie. Riparian hardwoods, primarily bur oak, Shumard oak, sugar hackberry, elm, ash, eastern cottonwood, and pecan, meander this prairie. The headwaters of several east Texas rivers begin in the Blackland Prairie region. In addition, the Trinity, Brazos and Colorado Rivers, and many tributaries of nearly every major system feeding the Gulf of Mexico, originate in or cross the Blackland Prairies (TPWD, 2012).

Figure 2 displays the distribution of habitat types within the USACE boundary at Joe Pool Lake. For analysis purposes, habitat types were pooled into one of four categories: deciduous forest, grassland, mixed forest, and riparian forest.

Results and Discussion

The total habitat score for each point surveyed is a representation of multiple habitat attributes including vegetative diversity and structure, site soil potential, successional stage, and uniqueness of that habitat across the landscape. Data analysis highlights are discussed below, while detailed data for each point surveyed can be found in Attachment A: Joe Pool WHAP Summary Results of this report.

Grassland (N = 21) and deciduous forests (N = 25) were the most abundant habitat types surveyed. Deciduous forest scores ranged from 0.38 to 0.75 while grassland scores fell between 0.38 and 0.79. The lower minimum scores, especially for these normally drier upland habitats, may be partly due to long-term flooding that occurred at Joe Pool Lake in recent years, thus leading to reduced plant diversity. Flooding at lower elevations in the flood pool of Joe Pool Lake Almost certainly led to mortality of the typically upland species of herbaceous plant growth. This certainly affected survey metrics within the inundated areas. Long-term flooding of Federal lands is a routine occurrence at typical Corps lakes having a primary mission of flood risk reduction.

The average, maximum, and minimum total score observed for each habitat type surveyed is shown in Table 3.

Table 3. Average, Maximum, and Minimum Total Scores per Habitat Type

Habitat Type	Average Total Score	Maximum Total Score	Minimum Total Score
Deciduous Forest	0.55	0.75	0.38
Grassland	0.61	0.79	0.38
Mixed Forest	0.56	0.82	0.40
Riparian Forest	0.60	0.85	0.40

Figures 3A, 3B, and 3C show the range of total scores for all points surveyed (N = 69) as well as the nine additional points that were skipped due to inaccessibility or multiple points occurring in the same area. Skipped points show a total score of 0 in figures 3A, 3B, and 3C. Overall, riparian forest and grassland habitats exhibited the highest average total score (0.60 and 0.61). In general, these habitats exhibited more woody and herbaceous vegetative species diversity than deciduous and mixed forests.

Also noteworthy, large scale grassland/prairie restoration efforts are underway at Joe Pool Lake, primarily within Cedar Hill State Park. Habitat scores are expected to climb in these areas as native plant diversity increases and restoration efforts near completion. Once complete, these areas are likely to become unique, highly valuable for wildlife as native prairie habitat in the region has largely been lost.

Beyond vegetative diversity, the three major metrics within the WHAP scoring criteria that allocate points are for site potential, successional stage, and uniqueness and relative abundance. Table 4 shows these metrics' average score per habitat type.

Table 4. Average Site Potential, Successional Stage, and Uniqueness and Relative Abundance Scores per Habitat Type

Habitat Type	\bar{x} Site Potential	\bar{x} Successional Stage	\bar{x} Uniqueness and Relative Abundance
Deciduous Forest	14.68	7.72	8.80
Grassland	11.40	4.95	7.00
Mixed Forest	13.22	8.78	8.89
Riparian Forest	17.13	11.07	9.67

Site potential allocates more points based on soil substrates characteristics and hydrologic connectivity that can support hydrophytic habitats, such as marshes, swamps, and bottomland hardwood forests that are often considered to be higher quality, more diverse habitat. This allows areas to score higher even though a recent disturbance, such as fire or flood, may have removed most of the vegetation. Areas scoring high in site potential but low in other metrics can be targeted for management efforts as these areas' vegetation community response should be favorable, thus increasing habitat value.

Successional stage refers to the age of the vegetative community. Older, mature forests, as do climax prairies, score higher than younger pole stands or disturbed grasslands as they provide more diverse forage, cover, and niche habitats. These scores are expected to increase across the board except in areas around the lake that may not have the soil types to support hydrophytic vegetation and are flooded frequently enough to limit upland forest or grassland growth and development.

Uniqueness and Relative Abundance takes into consideration the rarity of a habitat or vegetative community and its abundance in the region. Ongoing urban expansion has significantly influenced the region's remaining habitat composition. Few large, contiguous patches of habitat remain within the DFW metroplex. Joe Pool Lake and the surrounding terrestrial habitat represents one of these remaining patches that have become less abundant across the region. As urban development continues, the remaining habitat at Joe Pool Lake will likely increase in overall wildlife value and uniqueness.

Riparian forests are typically found in highly productive soils and consist of vegetation communities that persist and even thrive when exposed to frequent or extended periods of flooding. As such, these areas exhibited the highest average site potential, successional stage, and uniqueness and relative abundance scores among all habitat types surveyed.

As noted earlier, grassland/prairie restoration efforts have been in progress at Joe Pool Lake. Several of these sites were surveyed within Cedar Hill State Park as part of this effort. Overall, survey points #6, #8, #23, #65, and #73 (Figure 4) all scored over 0.70 indicating medium to high value grassland habitat. These areas largely represent the conservation and restoration efforts completed to date and are likely to increase in habitat value as restoration efforts continue. In addition, as the surrounding area continues to be developed, these remaining native prairie habitats will become increasingly unique in the region.

Only three points (9, 13, and 50) surveyed received scores over 0.80 indicating very high quality habitat. These areas support riparian and mixed forest habitats featuring high tree species diversity including mature pecan and oak canopy cover. In addition, these three points (Figure 5) all received the maximum scores for site potential, successional stage, and uniqueness and relative abundance criteria.

In summary, combining the WHAP analytical analysis, continued urban development, and spatial distribution of higher scoring points, two areas were identified as having higher quality in relation to the remaining lands administered by USACE at Joe Pool Lake. The two areas include land along the eastern shorelines within Cedar Hill State Park and land along Walnut Creek near SH360.

Recommendations

Even with planned and unplanned disturbances, there are numerous areas of valuable wildlife habitat remaining on USACE fee property at Joe Pool Lake.

The conservation and restoration management practices at Joe Pool Lake include prairie restoration sites entailing thinning and prescribed fire, and chemical treatment for the improvement of upland habitats with an overall goal of increasing native species diversity and maintaining overall health. Overall, habitat management has proven effective in maintaining medium- to high-quality wildlife habitat on USACE lands at Joe Pool Lake.

Based on the results of the WHAP survey efforts, areas to consider for Wildlife Management or Environmentally Sensitive Areas land classifications include those areas having the highest scores. The planning team for the Joe Pool Lake Master Plan revision will take into account the WHAP scores when making land classification decisions.

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Texas Parks and Wildlife Department (TPWD). 2012. Texas Conservation Action Plan 2012-2016: Texas Blackland Prairies Handbook. Editor, Wendy Connally, Texas Conservation Action Plan Coordinator. Austin, Texas.

Texas Parks and Wildlife Department (TPWD). 1995. Wildlife Habitat Appraisal Procedure (WHAP). Last revised January 12, 1995.

Joe Pool Lake WHAP Summary Result Figures

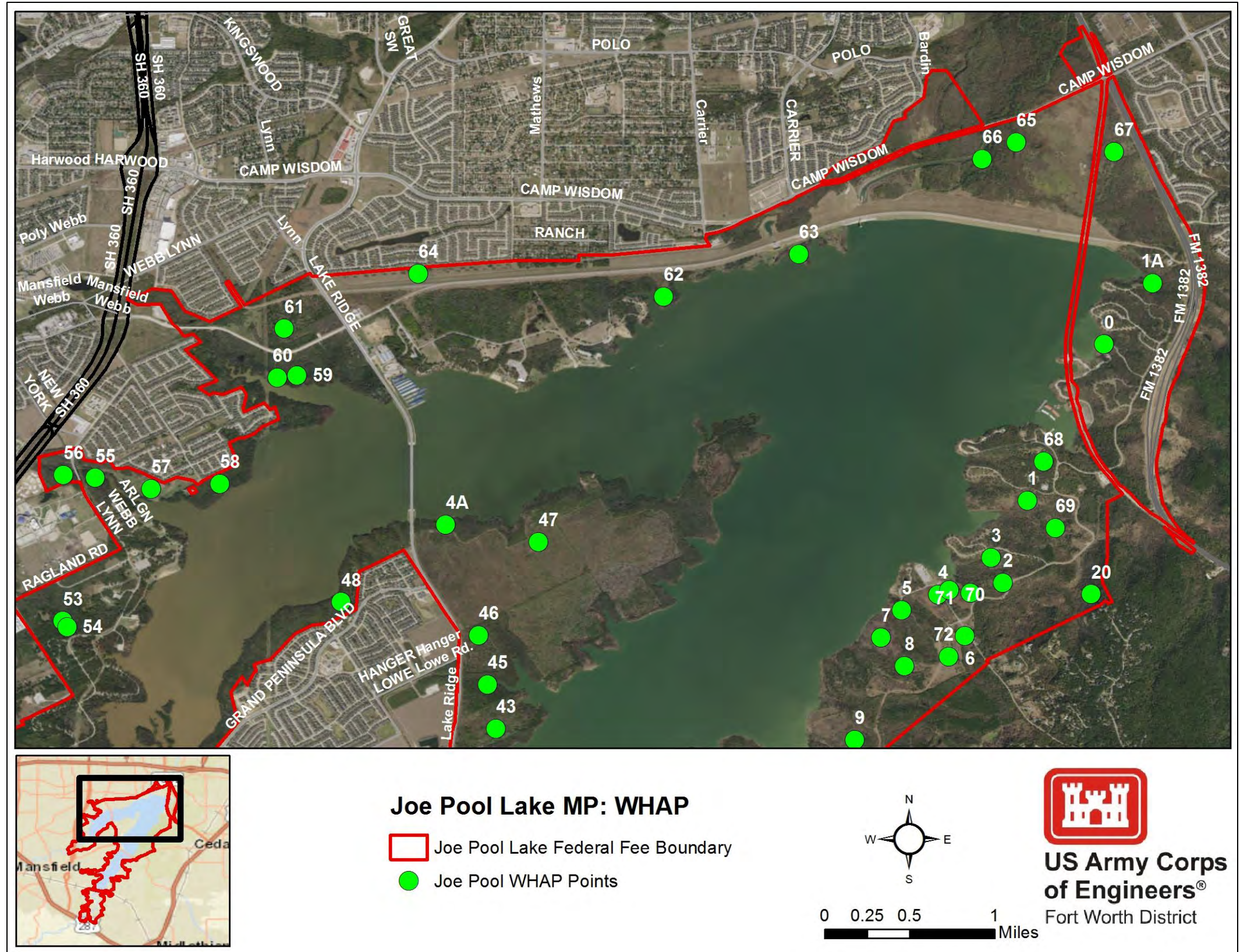


Figure 1A. Distribution of WHAP Points within the fee owned boundary at Joe Pool Lake.

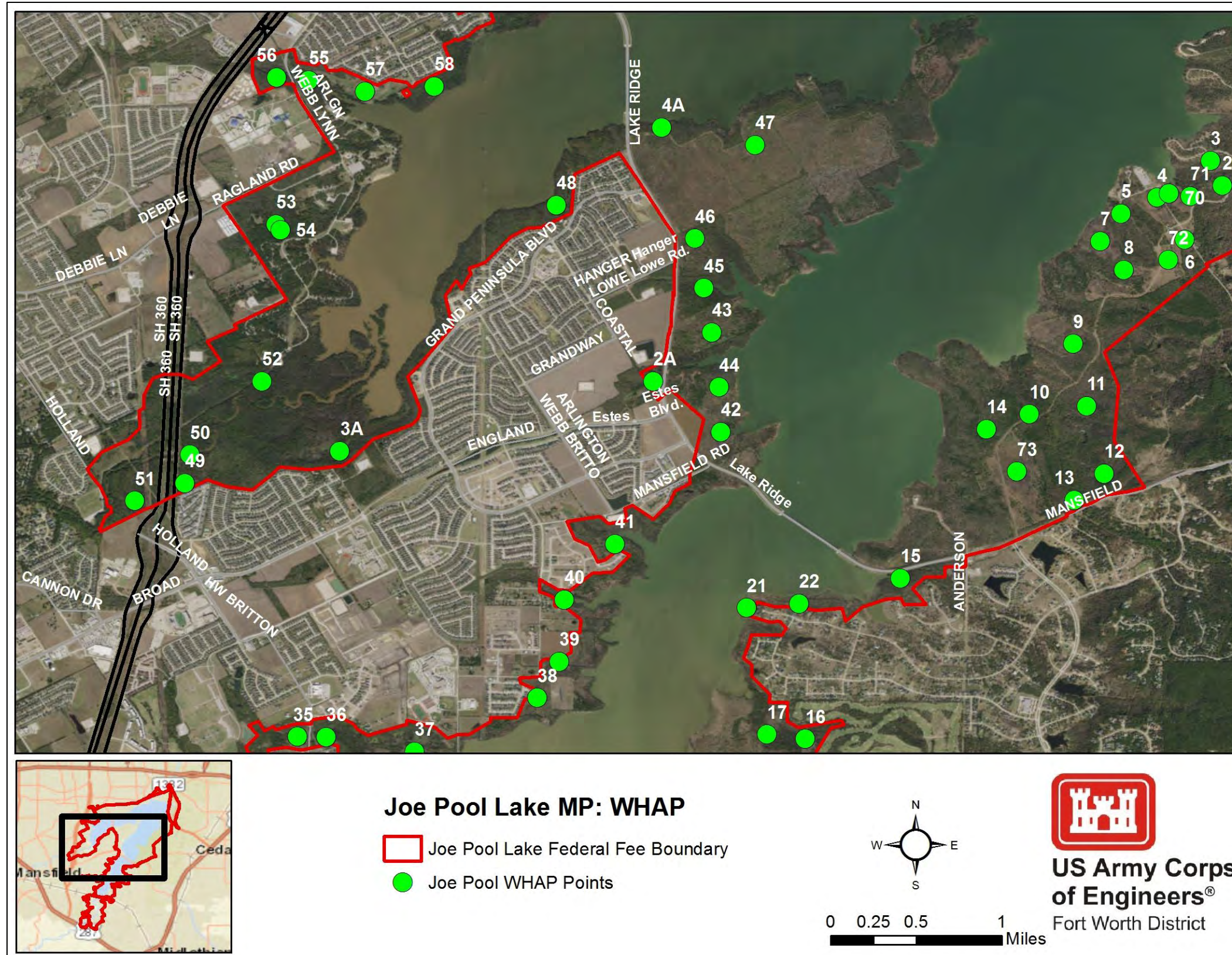


Figure 1B. Distribution of WHAP Points within the fee owned boundary at Joe Pool Lake.

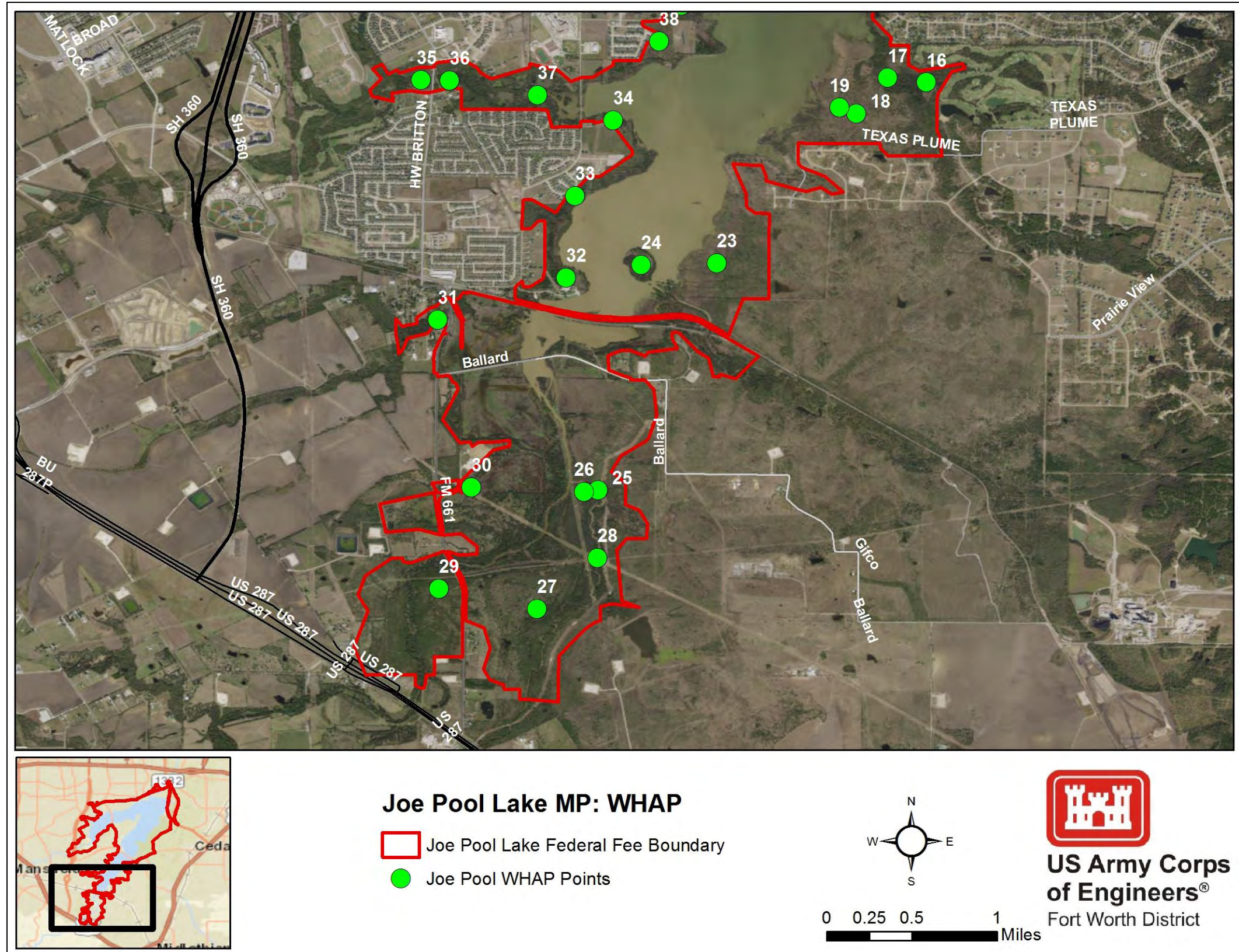


Figure 1C. Distribution of WHAP Points within the fee owned boundary at Joe Pool Lake.

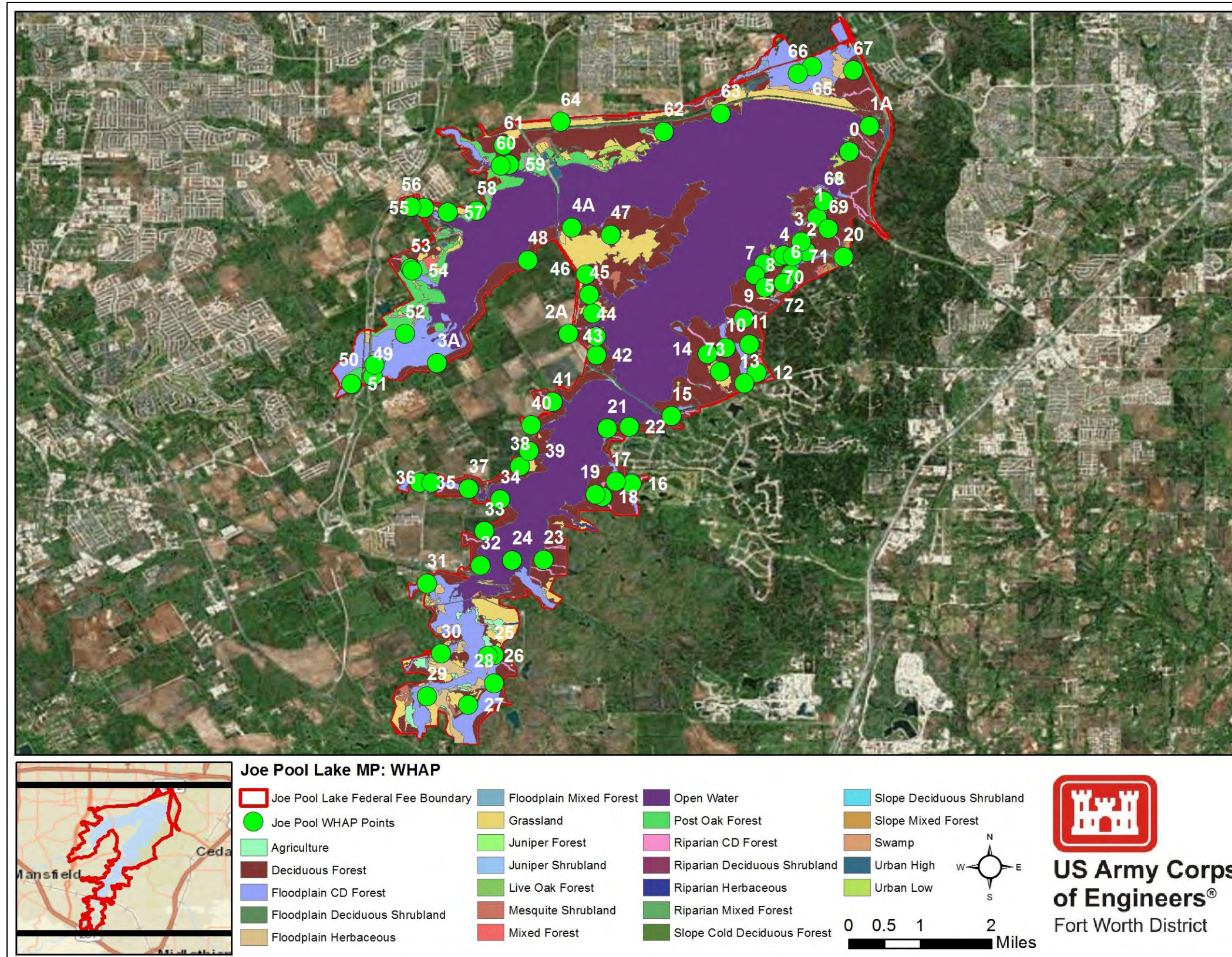


Figure 2. Distribution of Habitat Types within the fee owned boundary at Joe Pool Lake.

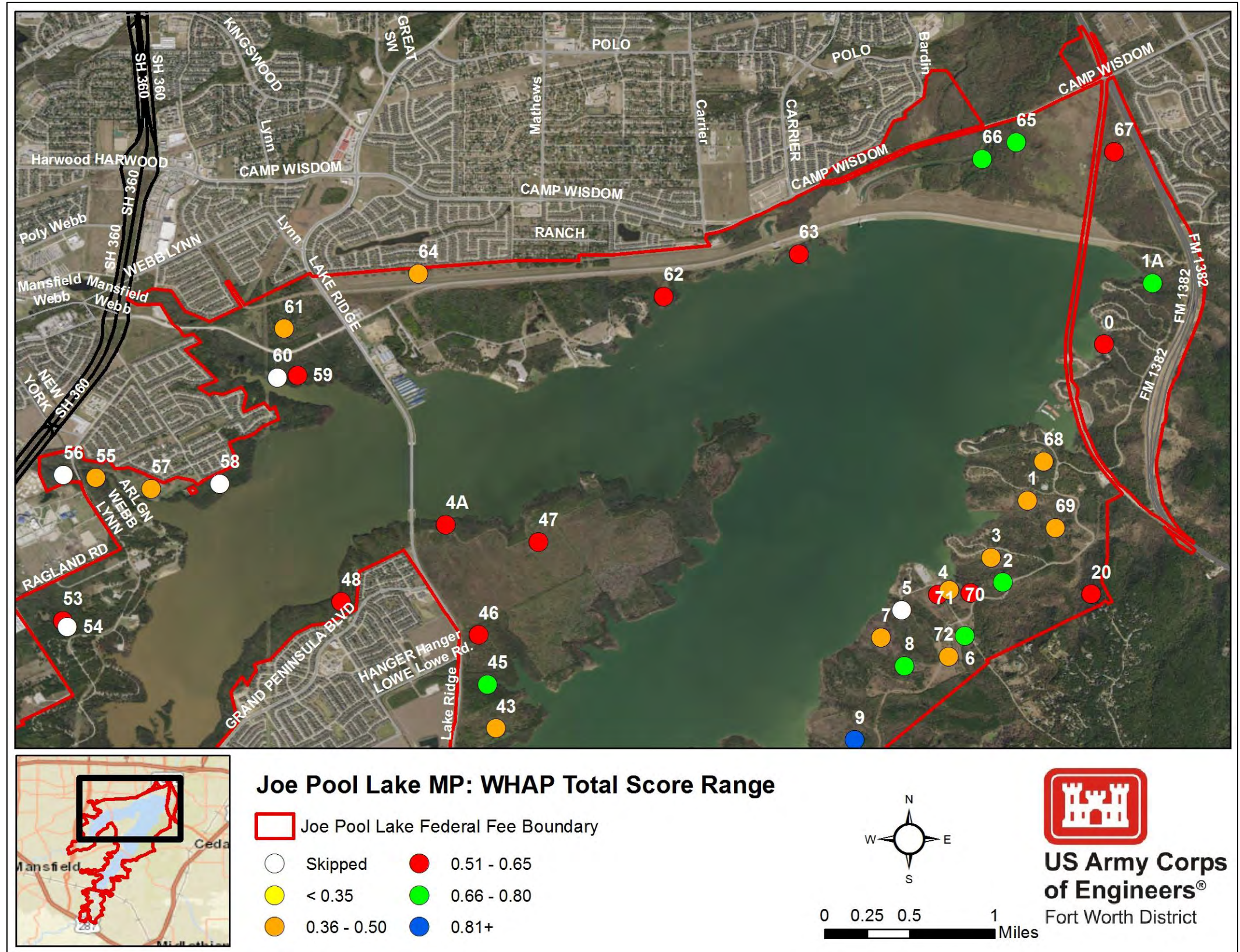


Figure 3A. Total Score Range for All Points Surveyed.

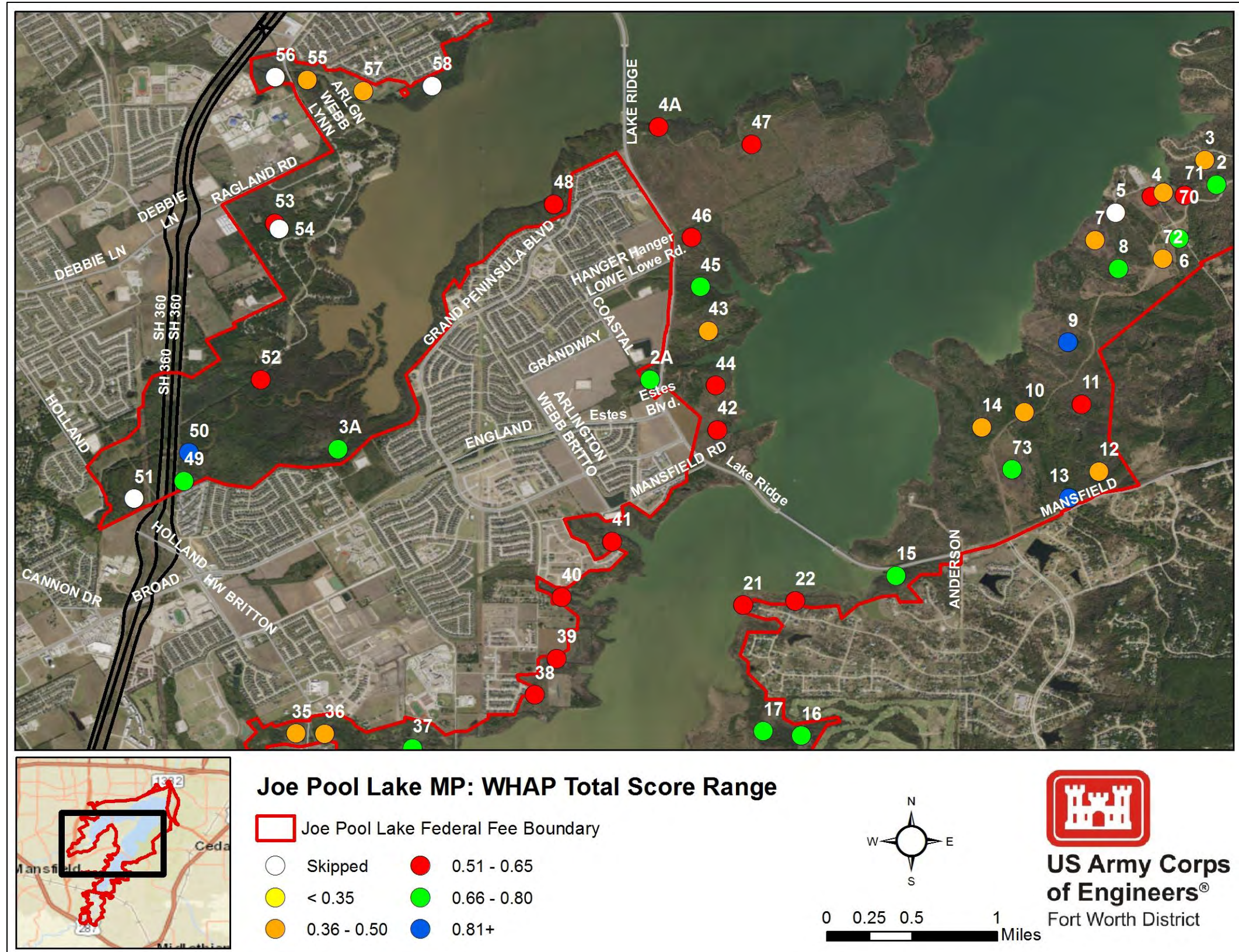


Figure 3B. Total Score Range for All Points Surveyed.

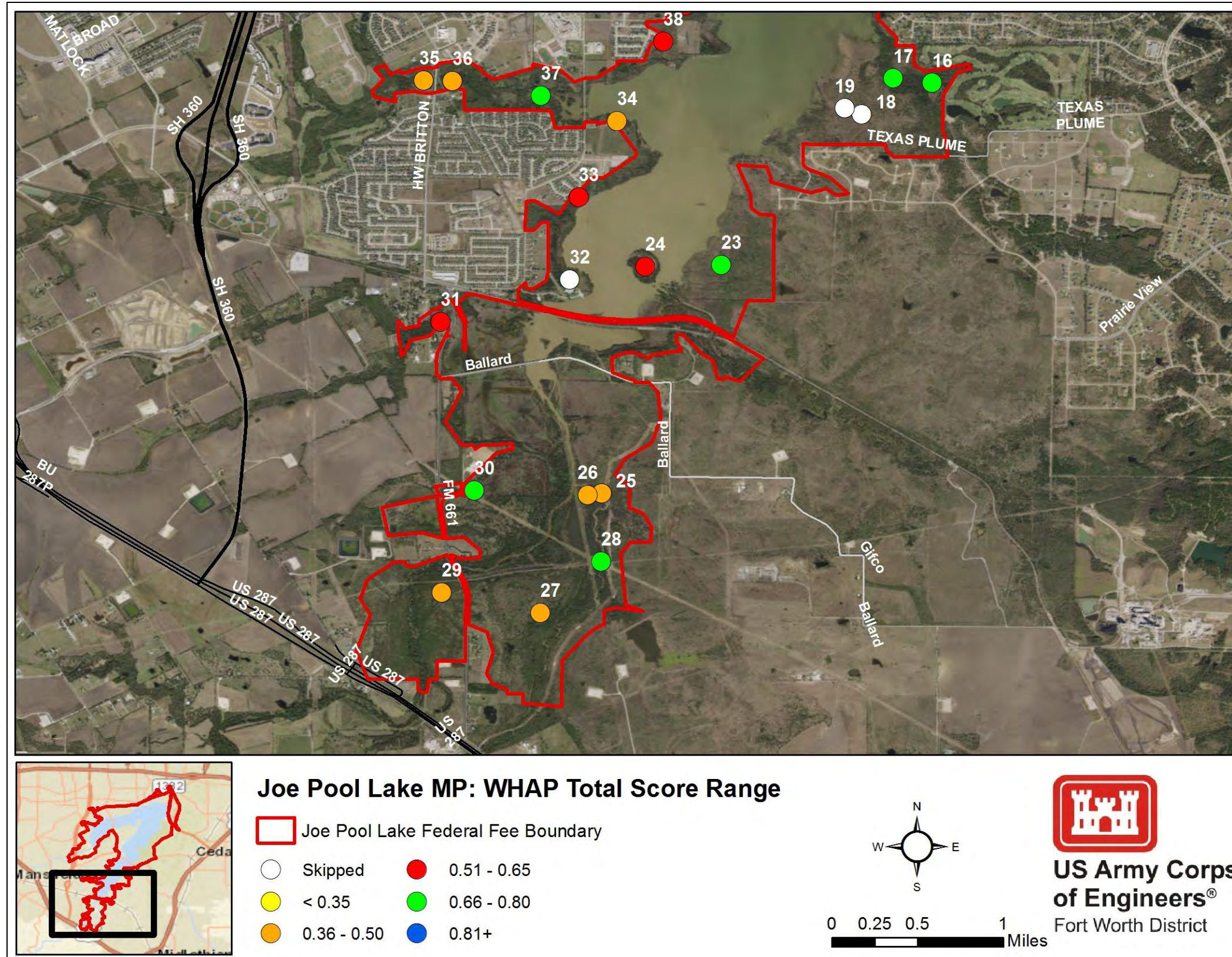


Figure 3C. Total Score Range for All Points Surveyed.

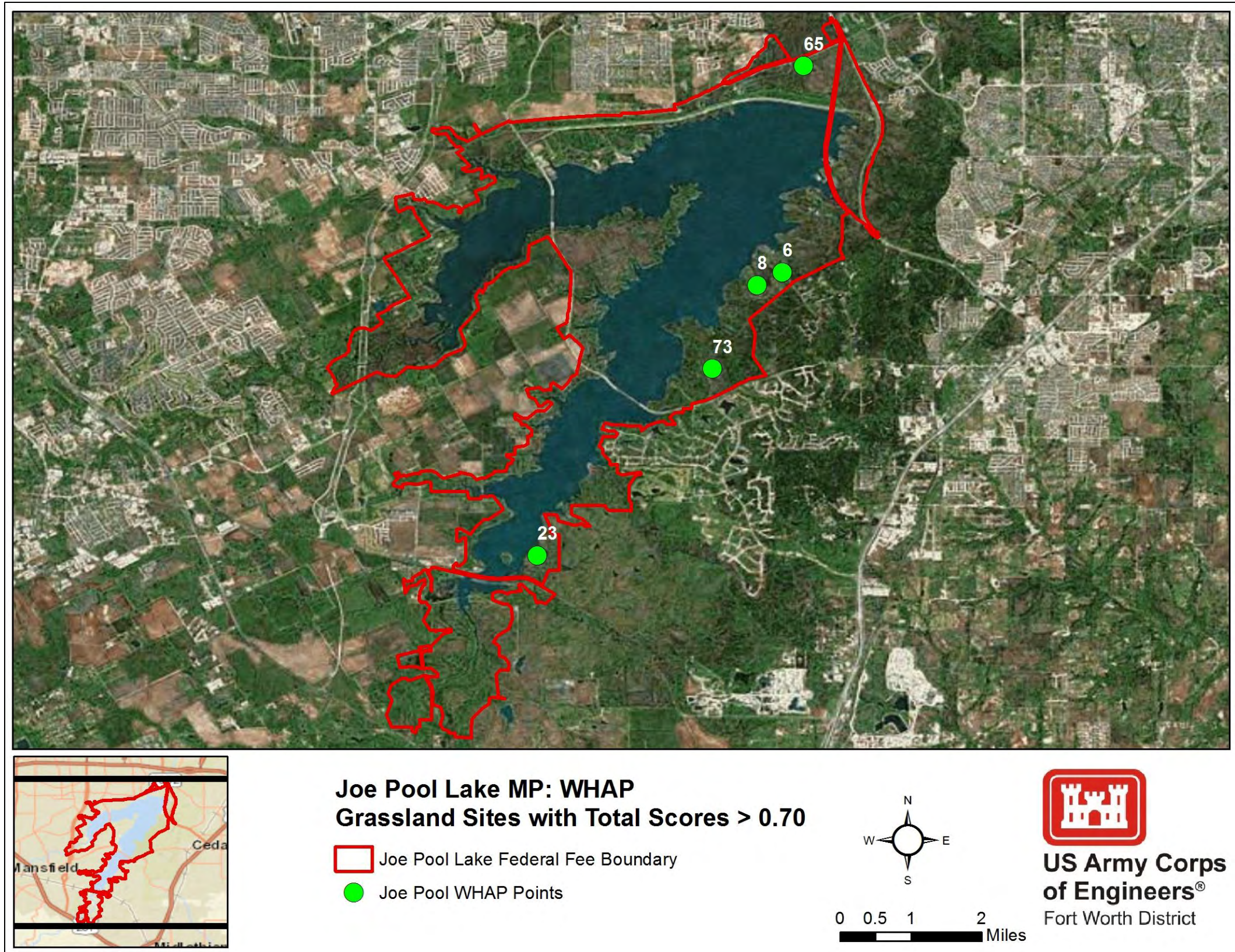


Figure 4. Grassland Sites with Total Score > 0.70.

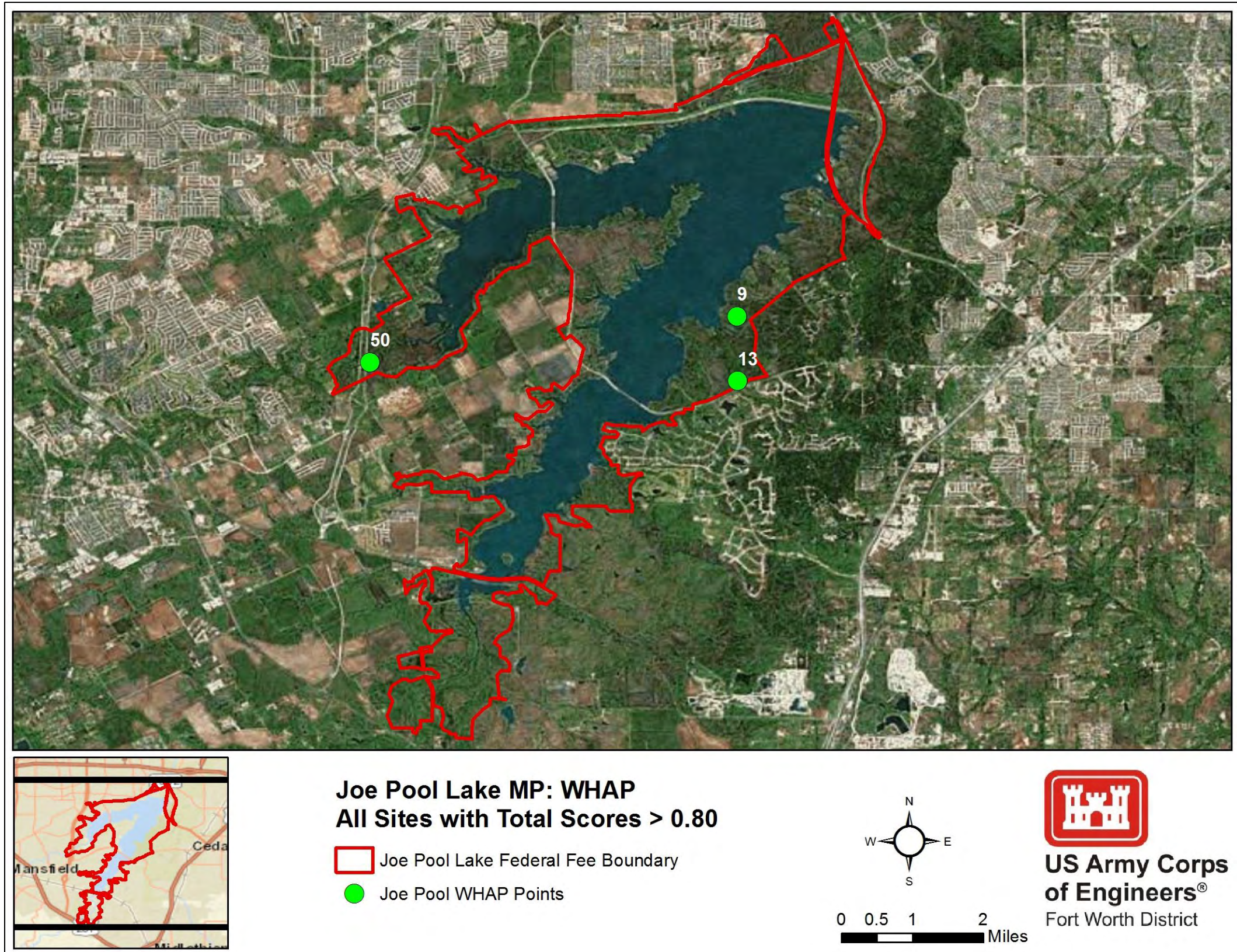


Figure 5. Survey Points with Total Score > 0.80.

Attachment A: Joe Pool Lake WHAP Results Summary

Point Number	Habitat Group	Total Score	Berry Drupe	Legume Pod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Remarks
0	Decidious Forest	0.54	Hackberry, unknown #1, Mistletoe, unknown vine	Mesquite, Locust	Post Oak	None	Winged Elm	Juniper	None	Prickly Pear	Doveweed, Beggar's Lice, Sunflower, Panicum sp, Beebalm, Ragweed, 3 misc, Silver Bluestem, Big Bluestem	None
1	Decidious Forest	0.49	Hackberry, American Persimmon	Mesquite, Locust	None	None	Winged Elm	Juniper	None	Prickly Pear	Doveweed, Big Bluestem, Sunflower, Snow on the Prairie, Beebalm, Wildrye, Thistle, Sensitive Brier, Broomweed, Tumbleweed, Gayfeather, Wood Sorrel, Side Oats Grama, Panicum Sp, Croton(goat weed), Beggar's Lice	Score doesn't reflect true value
1a	Decidious Forest	0.67	Hackberry, Greenbrier,	None	Shumard Oak	None	Cedar Elm, Green Ash	Juniper	None	None	Carex Sp, Giant Ragweed, Wildrye	Riparian
2	Grassland	0.66	Hackberry, Greenbrier, Persimmon, Privet, Sumac	Honey Locust, Mesquite	None	None	Winged Elm, Cedar Elm	Juniper	None	None	Beggar's Lice, Canada Wildrye, Ragweed, Thistle, Silver Bluestem, Milkweed, Sawgrass, Big Bluestem, 3 unknown spp.	chemical burn/mulched
2a	Decidious Forest	0.71	Hackberry, Poison Ivy	None	None	None	Green Ash	None	None	Cottonwood, Willow	Giant Ragweed, Goldenrod, Aster Spp.	Riparian

Point Number	Habitat Group	Total Score	Berry Drupe	Legume Pod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Remarks
6	Grassland	0.71	Hackberry, Gum Bumelia	None	None	None	Cedar Elm	None	None	Osage Orange	Paspalum, Western Ragweed, Ironweed, Giant Ragweed, Eastern Gamagrass, Indiangrass, Big Bluestem, Little Bluestem, Goldenrod, Wood Sorrel, Side Oats Grama, Snow on the Prairie, Blue Sage, 2 unknown forbs, Doveweed, Boneset	None
7	Grassland	0.43	Western Soapberry, Greenbrier, Hackberry, Hercules Club, Carolina Snailseed, Ballonvine	Locust, Mesquite	None	None	None	None	None	None	Little Bluestem, King Ranch Bluestem, Beggar's Lice, unknown forb	None
8	Grassland	0.71	Flameleaf Sumac, Hackberry, Greenbrier, Plum, Snailseed, Yaupon, Soapberry, Poison Ivy	Mesquite	None	None	Green Ash, Winged Elm	Juniper	None	Prickly Pear	Little Bluestem, Big Bluestem, Croton, Nut Sedge	None
9	Mixed Forest	0.82	Hackberry, Mexican Plum, 1 unknown, Sumac, Ballonvine	Mesquite	None	None	Winged Elm, Cedar Elm	Juniper	None	None	Broomweed, Croton, unknown (milkweed?), Queen Anne's Lace, Goldenrod, Indiangrass, Big Bluestem, Little Bluestem, Johnson Grass, Snow on the Prairie, Soapweed, , Scribner's Panicum	None

Point Number	Habitat Group	Total Score	Berry Drupe	Legume Pod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Remarks
10	Mixed Forest	0.48	Possum Haw, Privet, Gum Bumelia, Wild Plum	Mesquite	None	None	Cedar Elm	Juniper	None	Prickly Pear	Rosinweed, Rosinweed, Gayfeather, Little Bluestem, Indian Grass, Johnson Grass, Carex, Wintergrass, Sunflower	None
11	Decidious Forest	0.51	Cedar, Possum Haw, Yaupon, Mulberry	Mesquite	None	None	Cedar Elm	None	None	Prickly Pear, Osage Orange	Carex spp.	None
12	Decidious Forest	0.38	Hackberry, Corralberry, Juniper, Greenbrier, Possum Haw,	None	None	None	Cedar Elm, Ash	Juniper	None	Prickly Pear	Carex, Scribner's Panicum, 1 unknown	None
13	Riparian Forest	0.85	Poison Oak, Greenbriar, Poison Ivy, Juniper, Snailseed, Hackberry, grapes, Corralberry, Mulberry, Soapberry	None	Shumard Oak	Pecan	Ash, Cedar Elm, Winged Ash, American Elm	None	None	Cottonwood	Johnson Grass, Ragweed, Goldenrod, Inland Sea Oats, Wildrye, Sunflower, Scribner's Panicum, Aster spp, Paspalum	None
14	Mixed Forest	0.40	Plum	Mesquite	None	None	None	Juniper	None	Prickly Pear	Gayfeather, False Boneset, Broomweed, Sprangletop, Johnson Grass, Three Awn, Croton, Winter Grass	former dump site

Point Number	Habitat Group	Total Score	Berry Drupe	Legume Pod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Remarks
20	Mixed Forest	0.62	Poison Ivy, Strawberry, Rattanvine, Blackgum, Wild Plum, Hackberry, Persimmon, Peppervine, Greenbrier	Redbud	Shumard Oak, Bigelow Oak, Hybrid Red/Blackjack Oak, White Oak	Pecan, Mexican Buckeye	American Elm, Winged Elm	Juniper	None	Prickly Pear	Carex, Beggar's Lice	None
21	Grassland	0.54	None	Mesquite, Locust	None	None	Cedar Elm	None	None	None	Dodder, American Basketflower, Sumpweed, Doveweed, unknown grass, Sesbania, Aster spp, Mare's Tail	None
22	Grassland	0.57	Balloon Vine	Mesquite	None	None	None	None	None	Buttonbush	American Basket Flower, Broomweed, Doveweed, Mare's Tail, Eryngo, Switchgrass, Sumpweed, Pigweed, Blackeyed Susan, Western Ragweed, Frog Fruit, Cyperus spp, Sesbania spp,	None
23	Grassland	0.76	Hackberry, Gum Bumelia	Mesquite	None	None	None	Juniper	None	Opuntia spp.	Silver Bluestem, Gayfeather, Goldenrod, Little Bluestem, Broomweed, Japanese Brome, Switchgrass, Johnson Grass, Doveweed, Snow on the Prairie	None

Point Number	Habitat Group	Total Score	Berry Drupe	Legume Pod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Remarks
24	Grassland	0.57	Balloonvine	Locust, Mesquite	None	None	Green Ash	None	None	None	Johnson Grass, False Boneset, Aster, Sesbania, Switchgrass, Mare's Tail,	None
25	Riparian Forest	0.43	Bumelia, Hackberry	Mesquite	None	None	Cedar Elm	None	None	None	Wildrye	None
26	Mixed Forest	0.46	Hackberry	Mesquite	None	None	Cedar Elm	Juniper	None	Prickly Pear	Switchgrass, Sumpweed, Illinois Bunchgrass, Broomweed, Mare's Tail, unknown cool season grass, unknown forb, Broomweed, Giant Ragweed	None
27	Riparian Forest	0.47	None	Mesquite	None	None	Cedar Elm	None	None	Osage Orange, Black Willow	Sumpweed, Dodder, Cocklebur, Giant Ragweed, Mare's Tail, unknown cool season grass, Illinois Bunchgrass, Doveweed, Sedge	None

Point Number	Habitat Group	Total Score	Berry Drupe	Legume Pod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Remarks
28	Grassland	0.69	Hackberry	Mesquite, Locust	None	None	None	None	None	None	Doveweed, Little Bluestem, Snakeweed, Giant Ragweed, Snow on the Prairie, Gayfeather, American Basketflower, Beggar's Lice, Japanese Brome, Texas cupgrass, Sumpweed, unknown cool season grass, Wildrye, 2 unkown forbs, Wildrye, Carex spp	None
29	Riparian Forest	0.40	None	mesquite	None	None	Cedar Elm	None	None	None	Giant Ragweed, Sumpweed, cool season grass, Cyperus spp, Goldenrod	None
30	Grassland	0.66	None	Honey Locust	None	None	American Elm	None	None	Black Willow	Sumpweed, Balloon Vine, Eryngo, Illinois Bundleflower, Giant Ragweed, Dodder	None
31	Riparian Forest	0.60	Hackberry, Poison Ivy	None	None	None	None	Juniper	None	None	Giant Ragweed, Wildrye, unknown forb, Cyperus spp, Carex spp	None

Point Number	Habitat Group	Total Score	Berry Drupe	Legume Pod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Remarks
32	Skipped	Skipped	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
33	Mixed Forest	0.52	Hackberry, Soapberry, Greenbrier, Mulberry, Poison Ivy	Mesquite	None	None	None	Juniper	None	None	Wildrye, Beggar's Lice	None
34	Decidious Forest	0.45	Greenbrier, Gum Bumelia, Hackberry, Poison Ivy, Dogwood-Rough, Deciduous Holly, Western Soapberry,	Mesquite, Locust	None	Pecan	None	Juniper	None	Osage Orange	Wildrye, Giant Ragweed, Carex spp	None
35	Riparian Forest	0.47	Hackberry, Dewberry, Greenbrier	None	None	None	None	None	None	Osage Orange	Giant Ragweed, Wildrye	None
36	Riparian Forest	0.40	Hackberry, Privet, Gum Bumelia, Greenbrier, Poison Ivy	None	None	None	None	Juniper	None	Prickly Pear, Osage Orange	Panicum spp	None
37	Decidious Forest	0.68	Hackberry, Balloon Vine, Greenbrier, Muscadine, mulberry	Honey Locust	None	None	Green Ash, Cedar Elm	None	None	Osage Orange, Black Willow	Giant Ragweed, Thistle, Johnson Grass, Purpletop, 3 unknowns	None
38	Grassland	0.53	Gum Bumelia, Balloonvine	Mesquite	None	None	None	Juniper	None	None	Goldenrod, Switchgrass, False boneset	None

Point Number	Habitat Group	Total Score	Berry Drupe	Legume Pod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Remarks
39	Grassland	0.62	Hackberry	Mesquite	None	None	None	None	None	None	Sunflower, Johnson Grass, Goldenrod, Croton, Yellow Aster, Bunchgrass, Illinois Bundle Flower	
40	Riparian Forest	0.50	Hackberry, Flameleaf Sumac, Plum	None	None	None	Ash	None	None	Osage Orange, Buttonbush	Giant Ragweed, Beggar's Lice, Wildrye, 1 unknown	None
41	Grassland	0.62	Hackberry, Greenbrier, Flameleaf Sumac	Mesquite	None	None	Ash	None	None	None	Wildrye, Giant Ragweed, Beggar's Lice	None
42	Mixed Forest	0.60	Gum Bumelia, American Persimmon, Blackberry	None	None	None	None	Juniper	Baccaharis	Cottonwood	Snow on the Prairie, Johnson Grass, Thistle, Frog Fruit, Big Purple Flower, Sunflower, Blue Bonnet, Sensitive Brier, Cocklebur, Aster, Goldenrod, Unknown purple flower, Ragweed,	None
43	Decidious Forest	0.47	Hackberry, Dogwood, Poison Ivy	Mesquite, Honey Locust	None	None	American Elm	Juniper	None	None	Broomweed, Carex, 4 unknown herbacious spp, Ragweed, Scribner's Panicum, Doveweed	None
44	Decidious Forest	0.51	Hackberry, Greenbrier, Poison Ivy, Privet	Mesquite, unknown legume, Locust	None	None	None	Juniper	None	Prickly Pear	Carex, Sunflower, Beggar's Lice, Broomweed, Doveweed	None

Point Number	Habitat Group	Total Score	Berry Drupe	Legume Pod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Remarks
45	Riparian Forest	0.72	Hackberry, Greenbrier, Poison Ivy, Mulberry, Tievine, Strawberry, Balloonvine, Carolina Snailseed	Legume spp	None	None	None	None	None	Willow, Cottonwood	Ragweed, Carex spp x 2, Purple Aster, Hydracotyle, Nut Sedge, Dandelion, Morning Glory	None
46	Decidious Forest	0.56	Hackberry, Poison Ivy, Dogwood, Blackberry, 1 unknown	Mesquite, Honey Locust, 1 unknown	None	None	Winged Elm	Juniper	None	None	Ragweed, Milkweed, Goldenrod, Broomweed, White Aster. 2 unknown herbacious species, Doveweed	None
47	Grassland	0.56	Hackberry, Poison Ivy, Gum Bumelia	Mesquite, Locust	None	None	None	Juniper	None	None	Broomweed, cool season grass, White Aster, Yellow Aster, Snow on the Prairie, Queen Anne's Lace	None
48	Mixed Forest	0.57	Poison Ivy, Sumac, Blackgum, Greenbrier, Dogwood, Muscadine Grape,	Mesquite, unknown legume spp,	White Oak, Red Oak	Pecan	Winged Elm, American Elm	Juniper	None	Prickly Pear	Side Oats, Little Bluestem, unknown grass x2, Spindle Weed	None
49	Riparian Forest	0.68	Virginia Creeper, Poison Ivy, Gum Bumelia, Hackberry, Greenbrier, Privet	None	Shumard Oak	Pecan	Green Ash, Cedar Elm	Juniper	None	None	Inland Sea Oats, Giant Ragweed, Willdrye	None
50	Riparian Forest	0.81	Rusty Blackhaw, Mustang Grape, Deciduous Holly, Poison Ivy, Greenbrier	Locust	Post Oak, Bur Oak	None	Winged Elm	Juniper	None	None	Giant Ragweed, Inland Sea Oats, Prairie Aster, Panicum spp.	None

Point Number	Habitat Group	Total Score	Berry Drupe	Legume Pod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Remarks
57	Grassland	0.38	None	None	None	None	None	None	None	None	Goldenrod, Primrose, Johnson Grass, Love Grass, Carex, American Basketflower, Giant Ragweed, 1 unknown	None
58	Skipped	Skipped	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
59	Mixed Forest	0.58	Hackberry, Japanese Privet, Poison Ivy, Greenbrier, Red Mulberry	Honey Locust, Mesquite	None	None	None	None	None	Osage Orange	Unknown grass, unknown forb(geranium like), unknown forb(miniture pokeweed like)	None
60	Skipped	Skipped	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
61	Decidious Forest	0.45	Plum, Hackberry(seedling), Dewberry	Mesquite	None	None	Cedar Elm	Juniper	None	None	Johnson Grass, Silver Bluestem, Little Ragweed, Croton, Panicum, unknown forb, Vine Mesquite, Mullen spp, Weeping Lovegrass, 2 unknown forbs, Purpletop,	None
62	Decidious Forest	0.63	Privet, Hackberry, Poison Ivy, Virginia Creeper, Greenbrier	Mesquite	None	None	Cedar Elm	Juniper	None	None	None	None

Point Number	Habitat Group	Total Score	Berry Drupe	Legume Pod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Remarks
63	Decidious Forest	0.59	Hackberry, Greenbrier, 1 unknown	Honey Locust	None	None	Cedar Elm	None	None	None	Giant Ragweed, Wildrye, Panicun, Johnson Grass,	None
64	Decidious Forest	0.49	Poison Ivy, Hackberry	Mesquite	None	None	Elm	Juniper	None	Cottonwood, Willow	Johnson Grass, Panicum spp.	
65	Grassland	0.72	Hackberry, Poison Ivy, Gum Bumelia, unknown vine(3 leaflets)	None	None	pecan	Cedar Elm, Elm	None	None	None	Giant Ragweed, Beggar's Lice, Canada Wildrye, unknown forb(green spike flower), Panicum, Sunflower	None
66	Riparian Forest	0.75	Hackberry, Chinese Privet, Western Soapberry, Coralberry, Gum Bumelia, Greenbrier, Poison Ivy	None	Shumard Oak	None	Green Ash, Cedar Elm, Elm	None	None	None	Giant Ragweed, Canada Wildrye, Beggar's Lice, 3 unknown forbs, unknown grass	Moved to capture riparian woods.
67	Grassland	0.59	Hackberry	None	None	None	Cedar Elm	None	Baccharis	None	Broomweed, Goldenrod, Panicum, Beggar's Lice, Aster (small white bloom), Snow on the Prairie, Sensitive Brier, Thistle, unknown forb(brownseed pod), unknown forb(green spike flower)	None
68	Grassland	0.43	Snailseed	Legume spp	None	None	None	None	None	None	Johnson Grass, Sunflower, Croton, Thistle, 4 unknown	None

Point Number	Habitat Group	Total Score	Berry Drupe	Legume Pod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Remarks
69	Decidious Forest	0.49	Hackberry, Greenbrier, Blackgum	Mesquite, Locust	None	None	Green Ash	None	None	None	Goldenrod, Doveweed, Beggar's Lice, Ragweed, Broomweed, Canada Wildrye, Sensitive Brier, Wood Sorrel, Sunflower, 2 unknown spp	None
70	Decidious Forest	0.48	Greenbrier, Hackberry, Poison Ivy, Privet, Persimmon	Mesquite	None	None	Winged Elm	None	None	None	Croton, Little Bluestem, Johnson Grass, Western Ragweed, Thistle, Verbena, Snow on the Prairie	None
71	Decidious Forest	0.54	Hackberry	Mesquite	None	None	Winged Elm, American Elm	None	None	Prickly Pear	Thistle, Beggar's Lice, Goldenrod, Sunflower, Ragweed	Mulched greater than 1 yr.
72	Decidious Forest	0.44	None	Mesquite	None	None	None	None	None	None	Doveweed, Western Ragweed, Johnson Grass, Mare's Tail, American Basketflower, Side Oats Grama, Bromes Spp, Goldenrod, Sunflower, Aster spp	None
73	Grassland	0.79	Gum Bumelia, Mustang Grape, Wild Plum, Prickly Ash, Privet	Mesquite	None	None	Prickly Ash	Juniper	None	None	Thistle(purple), unknown, Johnson Grass, Bushy Bluestem, spiny aster, Goldenrod, Carex, Skunkweed, unknown (whiteflower)	None

Attachment B: Joe Pool Lake WHAP Point Photographs

Joe Pool Point #: 6

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 7

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 15

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 16

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 17

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 25

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 26

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 27

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 28

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 29

Facing North



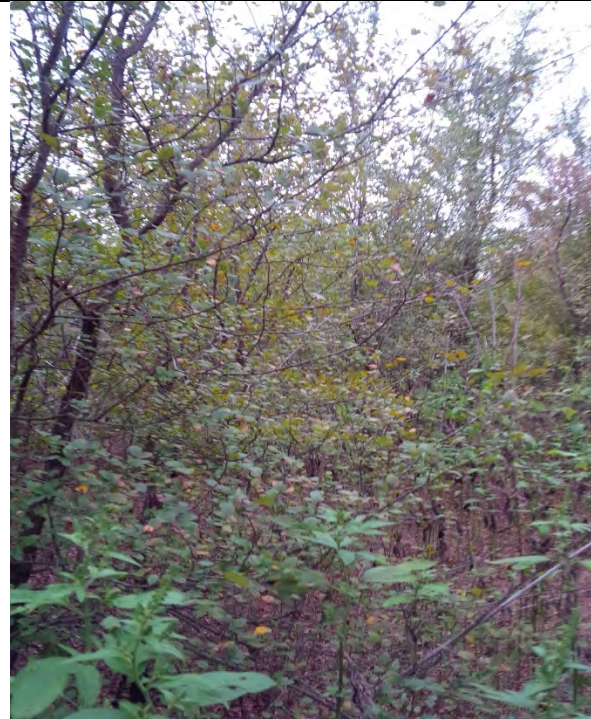
Facing East



Facing West



Facing South



Joe Pool Point #: 30

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 31

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 34

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 35

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 36

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 37

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 38

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 39

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 40

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 41

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 49

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 50

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 52

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 53

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 54

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 57

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 59

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 61

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 62

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 63

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 64

Facing North



Facing East



Facing West



Facing South



Joe Pool Point #: 72

Facing North



Facing East



Facing West



Facing South



APPENDIX D – PERTINENT PUBLIC LAWS

- House Document 74-308. Proposed the construction of the Caddoa Dam and Reservoir for flood control and irrigation purposes
- Public Law 74-738, Flood Control Act of 1936 as amended by the Public Law 75-761, Flood Control Act of 1938 – Authorized the construction of the Caddoa Dam and Reservoir for flood control and irrigation purposes.
- Public Law 76-667. Chapter 430, 3rd Session. Changed to name of the project to John Martin Reservoir Project in honor of John A Martin, the lake Congressman from Colorado.
- Public Law 78-534, Flood Control Act of 1944. Section 4 of the Act as last amended in 1962 by Section 207 of Public Law 87-874 authorizes USACE to construct, maintain, and operate public parks and recreational facilities in reservoir areas and to grant leases and licenses for lands, including facilities, preferably to Federal, State or local governmental agencies.
- Public Law 85-624, Fish and Wildlife Coordination Act 1958. – The FWCA as amended in 1965 sets down the general policy that fish and wildlife conservation shall receive equal consideration with other project purposes and be coordinated with other features of water resource development programs. Opportunities for improving fish and wildlife resources and adverse effects on these resources shall be examined along with other purposes which might be served by water resources development.
- Public Law 86-717, Forest Conservation Act. This Act provides for the protection of forest and other vegetative cover for reservoir areas under the jurisdiction of USACE.
- Public Law 89-298, Flood Control Act of 1965. Authorizes the Chief of Engineers to use and not to exceed 10,000 acre-feet of flood control storage space in the reservoir for the purpose of establishing and maintaining a permanent pool for fish and wildlife and recreations purposes at such times as storage space may be available for such permanent pool within the conservation pool as defined in Article III F, Arkansas River Compact (63 Stat. 145).
- Public Law 89-72, Federal Water Project Recreation Act of 1965. This Act requires that not less than one-half the separable costs of developing recreational facilities and all operation and maintenance costs at Federal reservoir projects shall be borne by a non-Federal public body. A HQUSACE/OMB implementation policy made these provisions applicable to projects completed prior to 1965.
- Public Law 91-190, National Environmental Policy Act of 1969. NEPA declared it a national policy to encourage productive and enjoyable harmony between man and his environment, and for other purposes. Specifically, it declared a “continuing policy of the Federal Government...to use all practicable means and measures...to foster and promote the general welfare, to create conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of

present and future generations of Americans.” Section 102 authorized and directed that, to the fullest extent possible, the policies, regulations, and public law of the United States shall be interpreted and administered in accordance with the policies of the Act. It is Section 102 that requires consideration of environmental impacts associated with Federal actions. Section 101 of NEPA requires the federal government to use all practicable means to create and maintain conditions under which man and nature can exist in productive harmony.

Specifically, Section 101 of the National Environmental Policy Act declares:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
 - Assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
 - Attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
 - Preserve important historic, cultural, and natural aspects of our national heritage and maintain wherever possible an environment which supports diversity and variety of individual choice;
 - Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities, and
 - Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.
- Public Law 89-665, National Historic Preservation Act of 1966 (NHPA). Establishes a national policy of preserving, restoring, and maintaining cultural resources. It requires Federal agencies to take into account the effect an action may have on sites that may be eligible for inclusion on the National Register of Historic Places.
 - Public Law 101-601, Native American Graves Protection and Repatriation Act. Requires Federal agencies to return Native American human remains and cultural items, including funerary objects and sacred objects, to their respective peoples.
 - Public Law 59-209, Antiquities Act of 1906. The first Federal law established to protect what are now known as "cultural resources" on public lands. It provides a permit procedure for investigating "antiquities" and consists of two parts: An act for the Preservation of American Antiquities and Uniform Rules and Regulations.
 - Public Law 74-292, Historic Sites Act of 1935. Declares it to be a national policy to preserve for (in contrast to protecting from) the public, historic (including prehistoric) sites, buildings, and objects of national significance. This act provides both authorization and a directive for the Secretary of the Interior, through the National Park Service, to assume a position of national leadership in the area of protecting, recovering, and interpreting national archeological historic resources. It also establishes an "Advisory Board on National Parks; Historic Sites, Buildings, and Monuments, a committee of eleven experts appointed by the Secretary to recommend policies to the Department of the Interior.”

- Public Law 87-874, Rivers and Harbors Act of 1962. This act authorizes the construction, repair, and preservation of certain public works on rivers and harbors for navigation, flood control, and for other purposes.
- Public Law 88-578, Land and Water Conservation Fund Act of 1965. This act established a fund from which Congress can make appropriations for outdoor recreation. Section 2(2) makes entrance and user fees at reservoirs possible by deleting the words "without charge" from Section 4 of the 1944 Flood Control Act as amended.
- Public Law 89-272, Solid Waste Disposal Act, as amended by PL 94-580, dated October 21, 1976. This act authorized a research and development program with respect to solid waste disposal. It proposes (1) to initiate and accelerate a national research and development program for new and improved methods of proper and economic solid-waste disposal, including studies directed toward the conservation of national resources by reducing the amount of waste and unsalvageable materials and by recovery and utilization of potential resources in solid waste; and (2) to provide technical and financial assistance to State and local governments and interstate agencies in the planning, development, and conduct of solid-waste disposal program.
- Public Law 90-483, River and Harbor and Flood Control Act of 1968, Mitigation of Shore Damages. Section 210 restricted collection of entrance fee at USACE lakes and reservoirs to users of highly developed facilities requiring continuous presence of personnel.
- Public Law 91-611, River and Harbor and Flood Control Act of 1970. Section 234 provides that persons designated by the Chief of Engineers shall have authority to issue a citation for violations of regulations and rules of the Secretary of the Army, published in the Code of Federal Regulations.
- Public Law 92-463, Federal Advisory Committee Act. The Federal Advisory Committee Act became law in 1972 and is the legal foundation defining how federal advisory committees operate. The law has special emphasis on open meetings, chartering, public involvement, and reporting.
- Public Law 92-500, Federal Water Pollution Control Act Amendments of 1972. The Federal Water Pollution Control Act of 1948 (PL 845, 80th Congress), as amended in 1956, 1961, 1965 and 1970 (PL 91- 224), established the basic tenet of uniform State standards for water quality. Public Law 92-500 strongly affirms the Federal interest in this area. "The objective of this act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."
- Public Law 92-516, Federal Environmental Pesticide Control Act of 1972. This act completely revises the Federal Insecticide, Fungicide, and Rodenticide Act. It provides

for complete regulation of pesticides to include regulation, restrictions on use, actions within a single State, and strengthened enforcement.

- Public Law 93-81, Collection of Fees for Use of Certain Outdoor Recreation Facilities. This act amends Section 4 of the Land and Water Conservation Act of 1965, as amended to require each Federal agency to collect special recreation use fees for the use of sites, facilities, equipment, or services furnished at Federal expense.
- Public Law 93-251, Water Resources Development Act of 1974. Section 107 of this law establishes a broad Federal policy which makes it possible to participate with local governmental entities in the costs of sewage treatment plan installations.
- Public Law 93-291, Archeological Conservation Act of 1974. The Secretary of the Interior shall coordinate all Federal survey and recovery activities authorized under this expansion of the 1960 act. The Federal construction agency may transfer up to one percent of project funds to the Secretary with such transferred funds considered non reimbursable project costs.
- Public Law 93-303, Recreation Use Fees. This act amends Section 4 of the Land and Water Conservation Act of 1965, as amended, to establish less restricted criteria under which Federal agencies may charge fees for the use of campgrounds developed and operated at Federal areas under their control.
- Public Law 93-523, Safe Drinking Water Act. The act assures that water supply systems serving the public meet minimum national standards for protection of public health. The act (1) authorizes the Environmental Protection Agency to establish Federal standards for protection from all harmful contaminants, which standards would be applicable to all public water systems, and (2) establishes a joint Federal-State system for assuring compliance with these standards and for protecting underground sources of drinking water.
- Public Law 94-422, Amendment of the Land and Water Conservation Fund Act of 1965. Expands the role of the Advisory Council. Title 2 Section 102a amends Section 106 of the Historical Preservation Act of 1966 to say that the Council can comment on activities which will have an adverse effect on sites either included in or eligible for inclusion in the NRHP.
- Public Law 99-662, The Water Resources Development Act. Provides for the conservation and development of water and related resources and the improvement and rehabilitation of the Nation's water resources infrastructure.

APPENDIX E – FORT WORTH DISTRICT NOTICE TO SEAPLANE PILOTS

NOTICE TO SEAPLANE PILOTS
U.S. Army Corps of Engineers, Fort Worth District
Prohibitions and Restrictions Governing the Use of Seaplanes

POLICY

In accordance with Title 36, Chapter III, Part 328 of the Code of Federal Regulations, it is the objective of the Corps of Engineers natural resources management mission to maximize public enjoyment and use of Corps lakes, consistent with their aesthetic and biological values. Within that context, the following restrictions governing the use of seaplanes have been developed.

DISTRICT-WIDE PROHIBITIONS AND RESTRICTIONS

1. Pilots are responsible for knowing the rules and regulations pertaining to aircraft as set forth in Title 36, Chapter III, Part 327.4 of the Code of Federal Regulations. Copies are available from any Corps of Engineers Lake Office.
2. Seaplanes may not be operated between sunset and sunrise. Where not specifically restricted or prohibited, recreational seaplane operations are allowed seven days a week.
3. Aircraft larger than 5,000 pounds gross weight are prohibited from landing without special permission from the District Engineer.
4. Commercial seaplane operations are prohibited unless authorized by the District Engineer. Commercial operations, if authorized, will be limited to the hours of 10 a.m. to 5 p.m., Monday through Friday, from November 1 to April 1.
5. Individual letter permits may be issued for seaplanes to operate in prohibited areas on a one-time-only basis.
6. The operation of a seaplane at Corps of Engineers lakes is at the risk of the plane's owner, operator, and passenger(s). All lakes in the Fort Worth District are operated as flood control reservoirs with widely fluctuating pool elevations. Pilots are encouraged to contact each lake project office for current pool elevation information. Addresses and phone numbers of each lake are listed in the attached Visitor's Guide. Information may also be obtained from the Corps of Engineers web site at www.swf.usace.army.mil
7. Where landings and takeoffs are not totally prohibited at a given lake, a minimum distance of 500 feet from shore or structures must be maintained during landing and takeoffs.
8. The attached information lists specific restrictions and prohibitions for each lake in the Fort Worth District.

SEAPLANE OPERATIONS ARE PROHIBITED ON THE FOLLOWING LAKES

Lake Georgetown
 Grapevine Lake
 Hords Creek Lake
 O.C. Fisher Lake
 B.A. Steinhagen Lake
 Waco Lake

SPECIFIC RESTRICTIONS ON SEAPLANE OPERATION

<p align="center">AQUILLA LAKE</p> <p>Seaplane operations are prohibited in all areas except on 'open water' areas of the lake from the dam northeast to the mouth of Hackberry Creek Branch and from the dam northwest to an East-West line extending from the north bank of the Old School branch.</p>	<p align="center">JIM CHAPMAN LAKE - COOPER DAM</p> <p>Landings and takeoffs are prohibited in the uncleared portion of the lake west of a line running from the west end of South Sulphur State Park to the peninsula at the mouth of Doctors Creek and in the cove formed Doctors Creek.</p>
<p align="center">BARDWELL LAKE</p> <p>Landings and takeoffs are prohibited north of Highway 34 and in all coves off the main body of the lake.</p>	<p align="center">GRANGER LAKE</p> <p>Landings and takeoffs are prohibited in both major arms of the lake formed by Willis Creek and the San Gabriel River and in the large, shallow lake area north of a line from the outlet structure to the east tip of the San Gabriel Wildlife Area.</p>
<p align="center">BELTON LAKE</p> <p>Landings and takeoffs are prohibited north of Highway 36, in the coves formed by Owl Creek and Cedar Creek, and in the arm of the lake formed by Cowhouse Creek upstream from the northwest end of the Fort Hood Recreation Area.</p>	<p align="center">JOE POOL LAKE</p> <p>Landings and takeoffs are prohibited in all lake areas west of the Lakeridge Parkway bridges.</p>
<p align="center">BENBROOK LAKE</p> <p>Landings and takeoffs are prohibited in the lake area south of the abandoned pump station on the east shore and in the coves formed by East and West Dutch Branch Creeks.</p>	<p align="center">LAKE O THE PINES</p> <p>Landings and takeoffs are prohibited in all coves and bays off the main body of the lake and in uncleared and shallow areas of the lake.</p>
<p align="center">CANYON LAKE</p> <p>Landings and takeoffs are prohibited upstream from Cranes Mill Park and in all coves and major bay areas off of the main body of the lake. (Including the large lake area east and west of Canyon Park.)</p>	<p align="center">LAVON LAKE</p> <p>Landings and takeoffs are prohibited in lake areas north of Collin Park, north of Tickey Creek Park, and in all coves and bays off the main body of the lake.</p>

SEAPLANE OPERATIONS ARE PROHIBITED ON THE FOLLOWING LAKES

Lake Georgetown
 Grapevine Lake
 Hords Creek Lake
 O.C. Fisher Lake
 B.A. Steinhagen Lake
 Waco Lake

SPECIFIC RESTRICTIONS ON SEAPLANE OPERATION

<p align="center">AQUILLA LAKE</p> <p>Seaplane operations are prohibited in all areas except on 'open water' areas of the lake from the dam northeast to the mouth of Hackberry Creek Branch and from the dam northwest to an East-West line extending from the north bank of the Old School branch.</p>	<p align="center">JIM CHAPMAN LAKE - COOPER DAM</p> <p>Landings and takeoffs are prohibited in the uncleared portion of the lake west of a line running from the west end of South Sulphur State Park to the peninsula at the mouth of Doctors Creek and in the cove formed Doctors Creek.</p>
<p align="center">BARDWELL LAKE</p> <p>Landings and takeoffs are prohibited north of Highway 34 and in all coves off the main body of the lake.</p>	<p align="center">GRANGER LAKE</p> <p>Landings and takeoffs are prohibited in both major arms of the lake formed by Willis Creek and the San Gabriel River and in the large, shallow lake area north of a line from the outlet structure to the east tip of the San Gabriel Wildlife Area.</p>
<p align="center">BELTON LAKE</p> <p>Landings and takeoffs are prohibited north of Highway 36, in the coves formed by Owl Creek and Cedar Creek, and in the arm of the lake formed by Cowhouse Creek upstream from the northwest end of the Fort Hood Recreation Area.</p>	<p align="center">JOE POOL LAKE</p> <p>Landings and takeoffs are prohibited in all lake areas west of the Lakeridge Parkway bridges.</p>
<p align="center">BENBROOK LAKE</p> <p>Landings and takeoffs are prohibited in the lake area south of the abandoned pump station on the east shore and in the coves formed by East and West Dutch Branch Creeks.</p>	<p align="center">LAKE O THE PINES</p> <p>Landings and takeoffs are prohibited in all coves and bays off the main body of the lake and in uncleared and shallow areas of the lake.</p>
<p align="center">CANYON LAKE</p> <p>Landings and takeoffs are prohibited upstream from Cranes Mill Park and in all coves and major bay areas off of the main body of the lake. (Including the large lake area east and west of Canyon Park.)</p>	<p align="center">LAVON LAKE</p> <p>Landings and takeoffs are prohibited in lake areas north of Collin Park, north of Tickey Creek Park, and in all coves and bays off the main body of the lake.</p>

SPECIFIC RESTRICTIONS ON SEAPLANE OPERATION	
LEWISVILLE LAKE	SOMERVILLE LAKE
Landings and takeoffs are prohibited in uncleared areas north of Crescent Oaks Park, the entire area west of IH 35 and north of Highway 720, and in large uncleared portions of the entire eastern half of the lake.	Landings and takeoffs are prohibited west of the west end of Birch Creek Unit of Somerville Lake State Park and in all coves and bays off the main body of the lake.
NAVARRO MILLS LAKE	STILLHOUSE HOLLOW LAKE
Landings and takeoffs are prohibited west of Wolf Creek Park 1.	Landings and takeoffs are prohibited west and south of Cedar Knob Road and in large shallow areas surrounding unnamed islands in the main body of the lake.
PROCTOR LAKE	WHITNEY LAKE
Landings and takeoffs are prohibited in all areas north and west of the eastern tip of Promontory Park and all areas west of the southwest tip of Promontory Park.	Seaplane operations are prohibited in areas downstream from a line drawn from the northern tip of Walling Bend park to the mouth of Frazier Creek and upstream from a line drawn from the mouth of Cedar Creek southwest to the opposite undeveloped shoreline. The coves formed by King Creek and Cedron Creek are also prohibited
RAY ROBERTS LAKE	WRIGHT PATMAN LAKE
Landings and takeoffs are prohibited north of Highway 3002 and in areas north and east of a line from the northeast tip of Johnson Park to the southwest tip of Jordan Park.	Landings and takeoffs are prohibited in all coves and bays off main body of lake and in uncleared and shallow areas of the lake.
SAM RAYBURN RESERVOIR	
Landings and takeoffs are prohibited west of Highway 147, north of Highway 83, and in scattered uncleared areas of the reservoir.	

NOTE: The latest revision to this Notice to Seaplane Pilots was completed in March of 2000.

APPENDIX F – ACRONYMS

ac-ft	Acre Feet
AQI	Air Quality Index
B.P.	Before Present
BMP	Best Management Practices
CAP	Climate Action Plan
CHSP	Cedar Hill State Park
CRMP	Cultural Resources Management Plan
CWA	Clean Water Act
DC	District Commander
DF	Deciduous Forest
DQC	District Quality Control
DQCB	District Quality Control Board
DM	Design Memorandum
EA	Environmental Assessment, NEPA Document
EMS	Ecological Mapping System
EOP	Environmental Operating Principles
EP	Engineering Pamphlet
EPA	United States Environmental Protection Agency
ER	Engineering Regulation
ESA	Environmentally Sensitive Area
°F	Degrees Fahrenheit
FONSI	Finding of No Significant Impact
FWCA	Fish and Wildlife Coordination act of 1958
GIS	Geographical Information Systems
HDR	High Density Recreation
HQ	USACE Headquarters (also HQUSACE)
IH	Interstate Highway
IPaC	Information for Planning and Consultation
KR	King Ranch (also King Ranch Bluestem)
LDR	Low Density Recreation
LEED	Leadership in Energy and Environmental Design
MP	Master Plan or Master Planning
MRML	Multiple Resource Management Lands
NAAQS	National Ambient Air Quality Standards
NCTCOG	North Central Texas Council of Governments
NEPA	National Environmental Policy Act, 1970
NGVD/NGVD29	National Geodetic Vertical Datum (1929)
NHPA	National Historic Prevention Act
NRHP	National Register of Historic Places
NOA	Notice of Availability
NRCS	Natural Resource Conservation Service
NRHP	National Registry of Historic Places
NVCS	National Vegetation Classification System
NWI	National Wetland Inventory

O&M	Operations and Maintenance
OMB	Office of Management and Budget
OMBIL	Operations and Maintenance Business Information
OMP	Operations Management Plan for a specific lake Project
OPM	Operations Project Manager
PDT	Project Development Team
PL	Public Law
PM	Project Management or Project Manager
PMP	Project Management Plan
PO	Project Operations
RBLH	Riparian Bottomland Hardwoods
RBS	Recreational Boating Survey
RIFA	Red Imported Fire Ant
RPEC	Regional Planning and Environmental Center
RTEST	Rare, Threatened, and Endangered Species of Texas
SCORP	Statewide Comprehensive Outdoor Recreation Plan (synonymous with TORP in Texas)
SGCN	Species of Greatest Conservation Need
SH	State Highway
SHPO	State Historical Preservation Office
SMPS	Shoreline Management Policy Statement
SIP	State Implementation Plan
SMU	Southern Methodist University
SWA	State Wildlife Area
TCAP	Texas Conservation Action Plan
TCEQ	Texas Commission on Environmental Quality
TPWD	Texas Parks and Wildlife Department
TORP	Texas Outdoor Recreation Plan
TRA	Trinity River Authority
TX	Texas
TXDOT	Texas Department of Transportation
TXNDD	Texas Natural Diversity Database
US	United States (U.S.)
USACE	United States Army Corps of Engineers
USFWS	U. S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VM	Vegetative Management Area
WDA	Workforce Development Area
WHAP	Wildlife Habitat Appraisal Procedure
WM	Wildlife Management Area